

September 20, 1956

The IRON AGE

The National Metalworking Weekly



Special Report:

15-Million Ton Expansion Means

More Steel In Your Future P.51

Oil: Metalworking Strikes Big Market P.57

How Over-Lubrication Shortens Bearing Life P.91

Digest of the Week P-2

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solid, homogeneous metal is easy to machine. To sum it all up, the blanks are *reliable*, all the way through. They make possible gears that are sound from teeth to hub.

Bethlehem forged - and - rolled blanks are produced in many sizes, the usual range being 10 to 42 in. OD. In addition to their uses in the

making of gears, they are also recommended for sheaves, crane wheels, and other circular steel products. A wide choice of sections is available. Write for the full story.

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Sept. 20, 1956—Vol. 178, No. 12

The IRON AGE

Digest of the Week in Metalworking

Starred items are digested at right.

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 Chestnut and 56th Sts. Philadelphia 39, Pa.

NEWS DEVELOPMENTS

CONGRESS LOOKS AT STEEL

DISTRIBUTION P. 55
 Complaints from independent steel fabricators and warehouses leads to Congressional probe. Fifteen steel producers have been asked to disclose percentage figures of shipments.

LABORATORIES: THE BROAD

NEW LOOK P. 56
 Westinghouse dedicates new laboratory in Pittsburgh. Many of the projects will stress the fundamentals—work on new concepts with no particular commercial application, or in uncharted fields along commercially feasible lines.

MERIT RATING: A POSITIVE

PLAN PAYS OFF P. 58
 One machine tool manufacturer has solved its wage differential inequities after years of experimenting with merit rating systems. It calls its plan an "employee improvement" program. The approach is unique.

TACONITE STRIDES INTO

THE BIGTIME P. 59
 Reserve Mining Company's \$190 million taconite processing plant in Minnesota is the first big operation completed. Three other huge plants in the U. S. and Canada are scheduled for completion by 1958.



Minnesota is the first big operation completed. Three other huge plants in the U. S. and Canada are scheduled for completion by 1958.



STEEL has big plans for its customers. Current expansion programs will add 15 million tons of capacity by end of 1958. Industry's broad plans and company-by-company projects are included in a Special Report on steel expansion, starting p. 51. (Allegheny Ludlum photograph).

HELP YOUR EMPLOYEES GUARD THEIR VISION

P. 60

With 10,000 workers falling victim to industrial eye accidents each year, an ounce of prevention is worth a pound of cure. Here's a discussion on two methods—visual testing programs and safety campaigns. Gaining cooperation of employees depends on use of proper psychological appeals.

FEATURE ARTICLES

OVER-LUBRICATION SHORTENS BEARING LIFE

P. 91

Ball and roller bearings function best when the right grade and correct amount of lubricant is properly applied. Overlubrication is a common cause of bearing failure, even more so than using too little oil or grease. Why use oil for some bearings, grease for others? What qualities should you seek in these lubricants? How do you avoid over or under lubrication? When should you replenish oil or grease? Here are the answers.

FLASHWELDER TRIMS FLASH AS IT WELDS

P. 94

Postweld cost for machining, grinding or chiseling flash from joints has held back flash-butt welding from its natural place as a fast, reliable joining method. Now one flashwelder eliminates need for separate flash removal by simply trimming upset metal from the workpiece as weld is made.

IS YOUR MACHINE SHOP SAFE TO WORK IN?

P. 96

A sound safety program for the shop is worth many times its cost, can help avoid all sorts of misfortunes, including expensive lawsuits. It's not complicated because the simplest safety device is good planning. Apply it first to shop neatness, working space, lighting and ventilation.

VACUUM MELTING IMPROVES NEW ALLOY'S PROPERTIES

P. 100

Such melting is winning new friends because of its ability to improve the heat- and corrosion-resistance in the newer aluminum and titanium bearing alloys. One such alloy is Hastelloy R-235. Superior properties imparted to this alloy include 20 pct higher stress-to-rupture for 100 hrs at 1500 F and better impact strength.

JOB-HOPPING PRESSES KEEP PACE WITH NEEDS

P. 104

Meeting ever-changing, contracts-lot production requirements is a tall order. Competitive margin may depend on how quickly and inexpensively you can change setups to meet these needs. For example, Morgan Spring Div.'s drive for efficiency has cut direct labor costs 20 pct. A major help was fitting their 150 punch presses with leveling vibration mounts.

MARKETS AND PRICES

SHIPBUILDERS WILL NEED MORE CHAMPAGNE

P. 54

With 41 merchant ships under construction or planned, the outlook is promising. Tanker building, conversion of present vessels is a big factor. Tight supply situation in steel could hamper the program. Industry requires large amounts of hard-to-find plate and structurals.

OILFIELD EQUIPMENT MARKET IS STRONG

P. 57

First half figures indicate a 25 pct jump in 1956 shipments of oilfield equipment. At this pace, it is likely that 1956 total will exceed the \$750 million mark. Offshore drilling and secondary recovery operations are setting trends in equipment design.

GM STRIKES FIRST WITH FUEL INJECTION

P. 68

First U. S. car with fuel injection system will be the Corvette. Ford and Studebaker-Packard also are considering the idea. While not everyone agrees on system's merits, it could spread to bread and butter models. Stylists favor it, engineers are still lukewarm to idea.

WHY SAN FRANCISCO IS A GOOD MARKET BET

P. 75

First in per capita income and savings, city has natural advantages as market and headquarters center. New firms added 10,000 jobs in seven year period. Metal industry's product value advanced 70 pct.

TOUGH TIMES AHEAD FOR STEEL CONSUMERS

P. 131

Outlook for steel supply gives consumers little to cheer about for balance of the year. Automotive orders coupled with resurgence in other fields is building up pressure on available supplies.

NEXT WEEK:

HOW TO GET MORE FOR YOUR INSPECTION DOLLAR

Quality control, as a method of management, depends upon inspection for its implementation. But what kind of inspection and how much? This feature, aimed at making your inspection dollar make even more sense, covers virtually every facet of inspection.



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Indexed in the Industrial Arts Index
and the Engineering Index.



EDITORIAL

Long-Term Shortsightedness

♦ MOST LARGE AND MEDIUM-SIZED companies draw the line on hiring people over 45 years old. The reasons are varied. Most of them are "logical" ones. All of them seem to make sense—on the surface.

It is obvious that no firm wants "floaters" or men who have not made up their minds where they are going by the time they reach middle age. But to put all such people looking for a job in that class is risky thinking.

A major reason why the number of unemployed in the 45 to 60-year bracket is on a sharp uptrend can be traced to pensions. In very few cases are pensions a "right" that can be moved from one job to another. Most company pensions were established to keep the force stabilized and cut down turnover.

Many firms have found that pensions and other benefits cost a lot of money—much more when the new employee is older. It does not "pay" to take on new employees at the ages of 45 to 60. The initial cost of funding out the fringes and benefits is much greater than for younger workers.

But this angle is not talked about publicly to any great extent. Reasons given for not hiring older workers are numerous. They run something like this: cranky; can't get along with others; too much illness; no loyalty; not productive enough; hard to teach new attitudes.

Scientific studies and surveys do not support such criticism of the 45 to 60-year-old worker. Up-to-date personnel people know this. But they can't easily change the policies set up by top management.

Many smaller companies and quite a number of medium-sized ones find that older workers as a rule are good employees, that they are loyal and that they are not troublesome. They learn quickly and many are skilled in trades and jobs that are in tight supply now.

The more these older workers are turned down by industry the greater chance there is for socialism in the long run. They will vote and agitate for laws that will help them get jobs—or income. Especially the latter.

It is long-term shortsightedness to arbitrarily turn down good employment prospects on age alone—regardless of what other "reasons" are given.

Tom Campbell

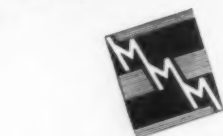
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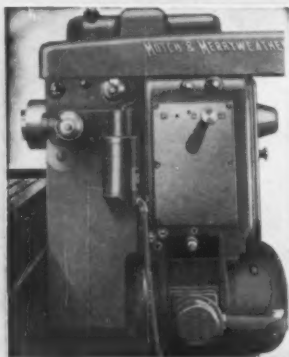


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dear editor:

letters from readers

Rises To The Defense

Sir:

Although not a frequent source of letters to editors, I must rise to defend the Federal Reserve Board and hard money in response to your editorial "Is The FRB A Sacred Cow?"

It seems to me that you overlook the real danger in the credit picture, the consumer. As you know, consumer credit has risen to unprecedented highs in recent years. This trend is really dangerous as shown by the subdued state of the automotive industry today, after excessive use of credit during 1954 and 1955, the years of the "hard sell." Consumer credit can, of course, be restrained by regulations of the Federal Government. However, the government already has too much influence on the daily lives of its citizens.

The FRB, charged with the duty of regulating the nation's money supply, can do so without bias against any particular industry or consumer, merely by making money more expensive for all. *P. Burgess, Muncie Malleable Foundry Co., Muncie, Ind.*

Zestful Explorer

Sir:

Thanks for your editorial "You Who Are About To Retire!" in the Sept. 6 issue. It is right up my "alley."

Since 1911 I have been engaged in the metalworking industry; mostly in the tool engineering field, which has sustained my lively interest in the development of new processes.

General Motors says that I must retire at the age of 65 years; however, there is another corporation here in the city that wants to get the benefit of my experience, and wide acquaintance in the industry.

I shall continue to explore with the same zest as the enthusiastic Scotsman, Don Gillies. Really, I don't need the money. *H. D. Hiatt, Indianapolis, Ind.*

Need Outside Help?

Sir:

We have read with interest your excellent article "How to Hit Your Market" (Aug. 30, p. 54). You omitted an important point, however. While some marketing studies can be performed by the company itself, many require outside marketing counsel.

Internal studies may, in general, be as valid and as competent as outside studies, but I think it is well to note that certain forms of research can only be performed by an outside party who has every reason to remain emotionally disinterested and impartial.

Please keep up your excellent work to educate industry in modern methods of market planning. *A. D. Ehrenfried, Pres., Technical Marketing Associates, Inc., Concord, Mass.*



Remember that we're all one big happy family here, Binks, but don't forget that I'm the head of it.

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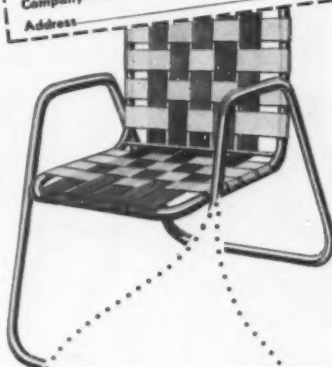
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Chilli Con ASM

Chances are you wouldn't expect our editors to tie-in their culinary tastes with next week's Metal Show issue. But some of these boys will go a long way to prove a point.

In fact, one of them almost got himself killed trying to show that Inspection—the big feature of our Metal Show Issue—is one of the most important problems in all industries.

You'll get what we mean from this priceless letter he received from one of the country's largest meat packers:

Dear Sir:

Those bits of metal you found in our chili had no business there and it was mighty considerate of you to write us and especially to write such an understanding letter.

They are a metal clip such as are used to fasten paper covers on wooden barrels in which we receive boneless beef purchased from other packers. You see, the demands of our Chili Department and our Sausage Departments for fresh boneless beef far exceed our own capacity to produce, and we are forced to buy on the outside.

Evidently somebody unfastening a barrel cover allowed one of these clips to get in with the beef and it remained unnoticed all the way through our inspection and process, and that is the point at which we intend to conduct a thorough-going investigation.

How fortunate no one was harmed. Certainly I would hate to get one of these bits of metal in my throat. As I eat a considerable amount of chili, this is just what might have happened, so you really performed a public service.

Yours very truly,

Name Withheld

Now as far as we're concerned you can take chili or leave it alone. Sausage, too, for that matter.

But there is a moral here. And that is that product quality has always been a prime selling point—especially in the metalworking industry. Either you develop it and hang on to it, or you resign yourself to a rather dim business future.

How to develop and retain product quality is what the feature on Inspection (No. 6 in the "How To Get More For Your Metalworking Dollar" Series) is all about.

It starts with the principles of a workable system for "rough" in-



Moore Special Tool Co.

Next Week—Inspection

spection of incoming materials, follows inspection procedures throughout the manufacturing process, and winds up with the "finished" inspection of the end product . . . the one that either sells or doesn't, depending upon its quality.

Added to the Inspection Feature our Sept. 27 Metal Show Issue will also include: a comprehensive report on new products displayed at the Show; a complete list of exhibitors and their booth numbers; and technical programs of all participating societies.

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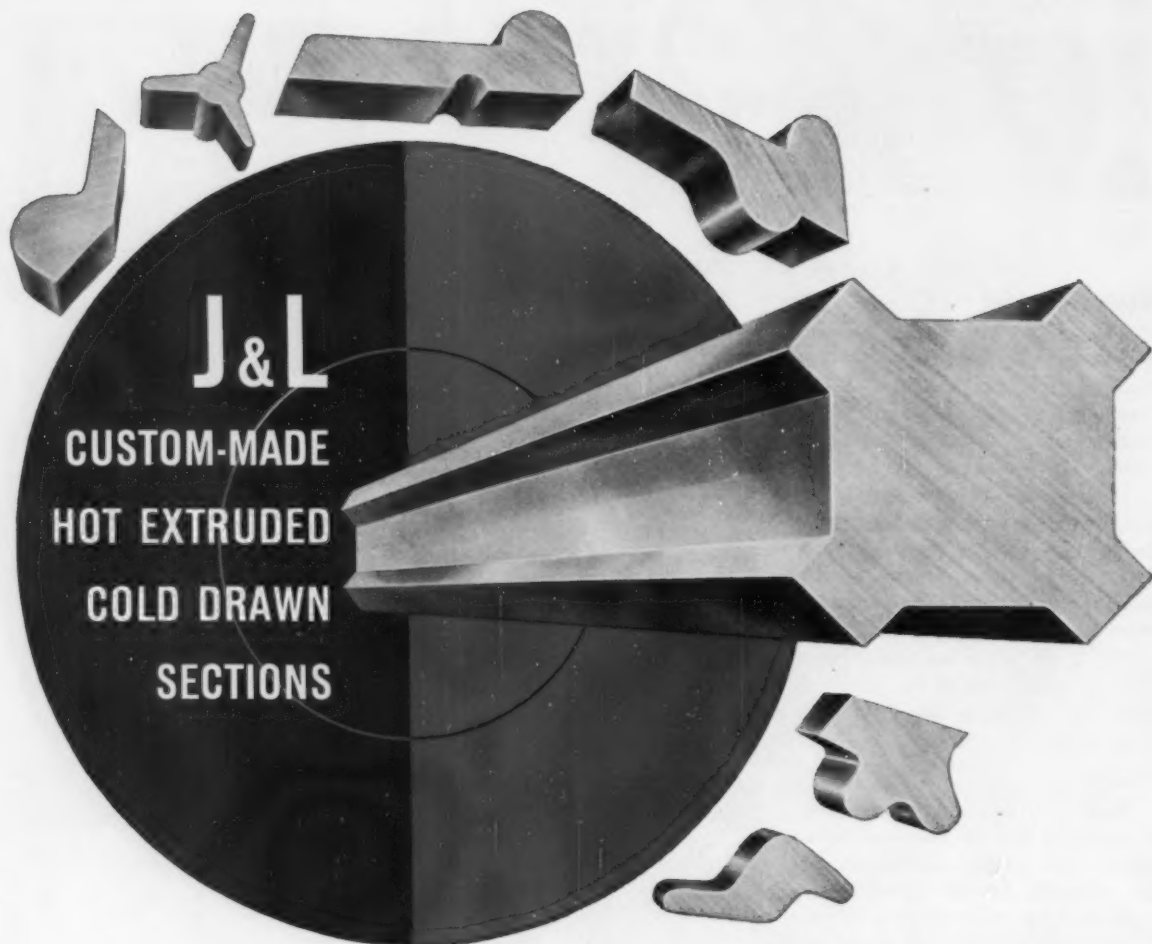
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THREE OF **The IRON AGE**
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dates to remember

SEPTEMBER

Steel Founders' Society of America—Fall meeting, Sept. 24-25, The Greenbrier, White Sulphur Springs, W. Va. Society headquarters, 606 Terminal Tower, Cleveland.

The Material Handling Institute—Fall meeting, Sept. 24-26, The Greenbrier, White Sulphur Springs, W. Va. Society headquarters, 813 Clark Bldg., Pittsburgh.

The Atomic Industrial Forum—Second annual trade fair, Sept. 24-28, Navy Pier, Chicago. Society headquarters, 260 Madison Ave., New York.

EXPOSITIONS

Assn. of Iron & Steel Engineers, Sept. 25-28, Cleveland.

Metal Show—Oct. 8-12, Cleveland.

OCTOBER

American Institute of Electrical Engineers—Fall general meeting, Oct. 1-5, Morrison Hotel, Chicago. Society headquarters, 36 W. 46th St., New York.

Society of Automotive Engineers, Inc.—National aeronautic meeting, Oct. 2-6, Hotel Statler, Los Angeles, Calif. Society headquarters, 29 W. 39th St. New York.

Standard Engineers, Society—Fifth annual meeting, Oct. 2-5, Hotel Willard Washington, D. C. Society headquarters, P. O. Box 281, Camden, N. J.

The Magnesium Assn.—Twelfth annual convention, Oct. 4-5, The Drake, Chicago. Society headquarters, 122 E. 42nd St. New York.

American Society of Mechanical Engineers—American Society of Lubrication Engineers—Lubrication conference, Oct. 8-10, Chalfonte-Haddon Hall, Atlantic City, N. J. Society headquarters, 29 W. 39th St., New York.

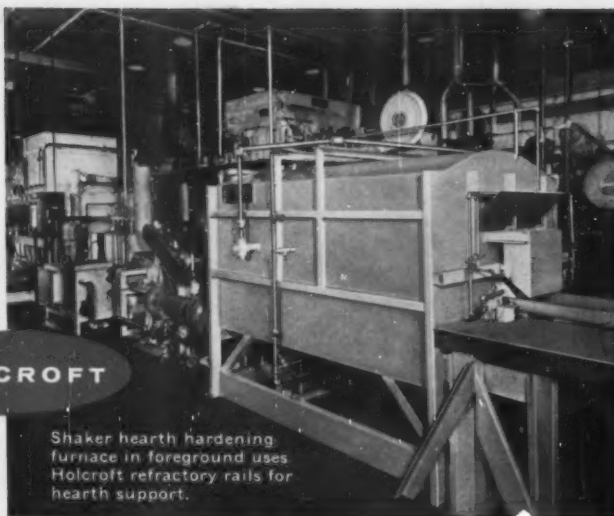
The Material Handling Institute, Inc.—Fall meeting, Oct. 10-11, The Traymore Hotel, Atlantic City, N. J. Society headquarters, One Gateway Center, Pittsburgh.

American Institute of Mining & Metallurgical Engineers—Fall meeting, Oct. 12, Warwick Hotel, Philadelphia. Society headquarters, 29 W. 39th St., New York.

Conveyors Equipment Manufacturers Assn.—23rd annual meeting, Oct. 20-23, The Greenbrier, White Sulphur Springs, W. Va. Society headquarters, One Thomas Circle, Washington, D.C.

BLAZING
THE
HEAT
TREAT
TRAIL—
WITH

HOLCROFT



Shaker hearth hardening furnace in foreground uses Holcroft refractory rails for hearth support.

LET'S TALK ABOUT REFRACTORY RAILS

With the current shortage of nickel, furnace manufacturers are looking for ways to replace or conserve this scarce commodity. It is interesting to note that Holcroft tackled this same problem during World War II when a nickel shortage also faced the industry.

In 1945 we designed and installed a pusher tray gas atmosphere furnace that used refractory skid rails instead of the nickel chrome alloys used at that time. Since then we have expanded their use to many other comparable applications so that now there is positive proof that properly designed installations of refractory skid rails last much longer, under similar conditions, than those made from nickel alloys. Replacements have been negligible—performance has been superior—material costs have been lower—and a marked decrease in wear on work carriers has been noted.

Yes, today a nickel shortage still exists—but Holcroft offers a job-proven answer, not only for the rails but for other vital parts of a heat treat furnace as well. You can bank on Holcroft's engineering leadership and experience—the kind that saves not only nickel—but dollars, too! Write for information.

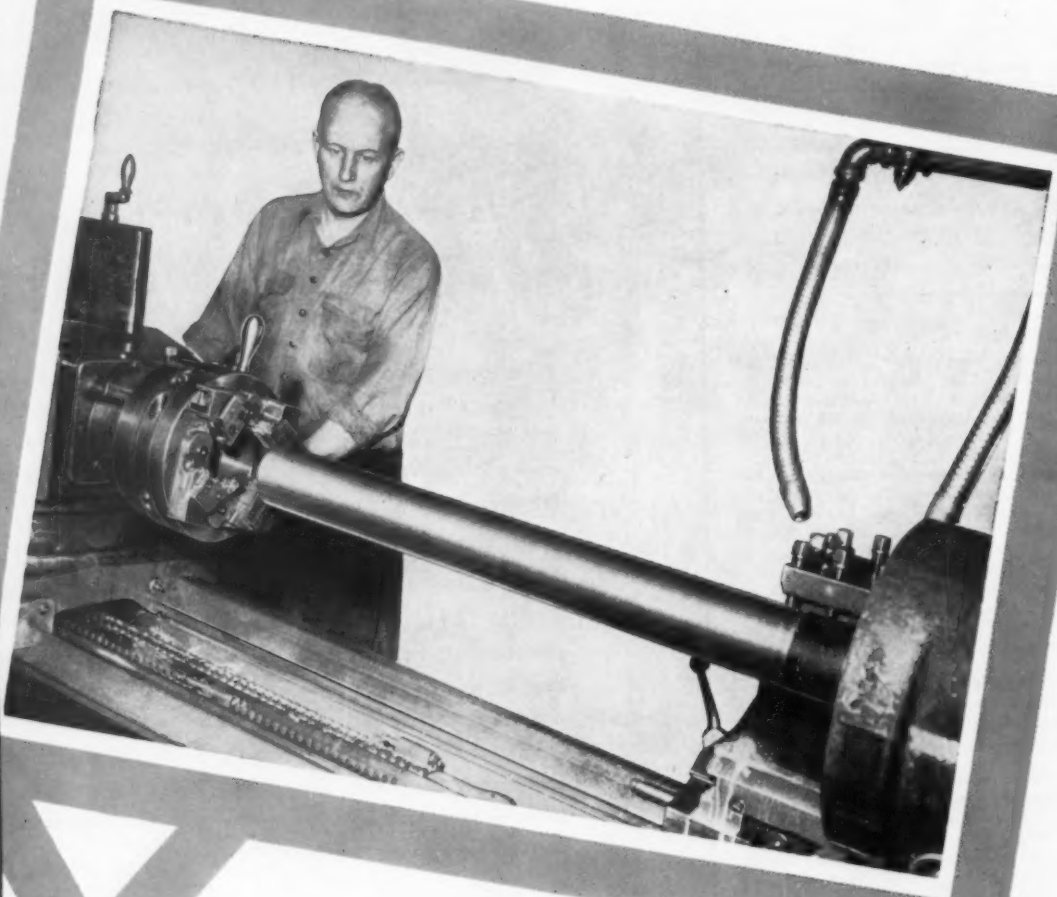
HOLCROFT AND COMPANY



6545 EPWORTH BOULEVARD • DETROIT 10, MICHIGAN
PRODUCTION HEAT TREAT FURNACES FOR EVERY PURPOSE

CHICAGO, ILL. • CLEVELAND, OHIO • DARIEN, CONN. • HOUSTON, TEXAS • LOS ANGELES, CALIF. • PHILADELPHIA, PA.
CANADA: Walker Metal Products, Ltd., Windsor, Ontario

THE WORLD'S LARGEST MANUFACTURER OF THREADING EQUIPMENT - CUTTING - TAPPING - GRINDING - ROLLING





3 1/4" 8P threads-29" long with LANDMATIC 32 AX Head

4150 steel heat-treated to 28-32 Rockwell "C" is threaded to a Class 3 fit by a LANDMATIC 32 AX Head. Rugged tangential chasers provide long life and allow threading after heat treating. Special centering throats on these chasers eliminate the out-of-round condition common in long workpieces.

This stationery self-opening head is used on a 3A Warner & Swasey turret lathe to thread tie bars for plastic injection molding machines at the Reed Prentice Corp., Worcester, Mass.

The 32AX LANDMATIC Head will thread workpieces up to 4" in

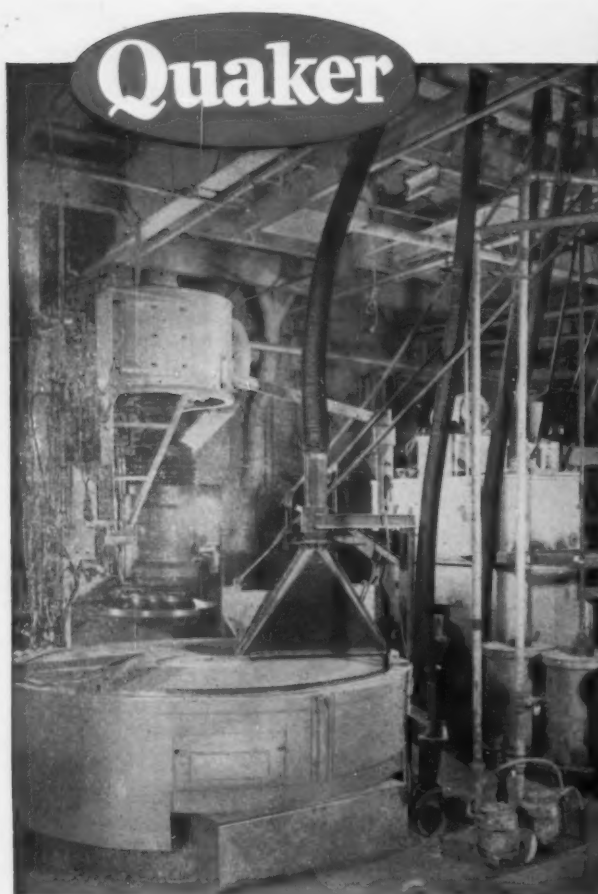
diameter through the bore, and cut 8 pitch or finer threads up to any practical length. By using oversize chaser holders short lengths of threads can be cut on larger workpieces up to 6 1/4" in diameter. A larger head, the 40AX, features a six-chaser design to give greater distribution of cut and greater support to large diameter workpieces. This head will cut threads up to a maximum of 9 1/4" in diameter with the same pitch limitations.



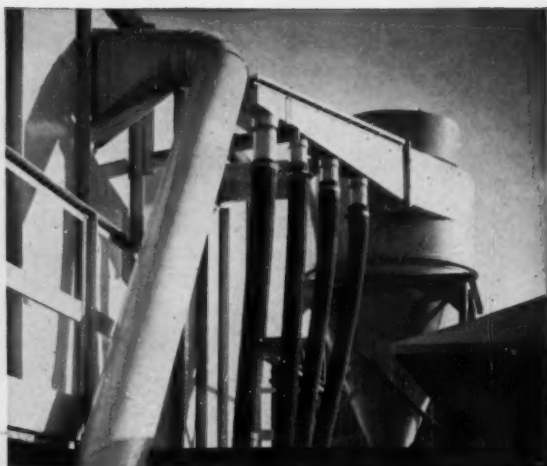
For more information on the 32AX LANDMATIC Head, send specifications and ask for Bulletin No. F-90.

LANDIS Machine Company
WAYNESBORO • PENNSYLVANIA • U. S. A.

405-2C



Quaker Exhaust hose at Simonds Abrasive Company, Philadelphia, Pa.



**This exhaust hose
already 4 times longer lasting in
this grinding wheel plant...**

Your Quaker-Quaker Pioneer distributor can supply not only your standard needs—but also your highly specialized ones. You'll find him a prompt dependable money-saving source for everything you need in rubber products. Write for free brochure and name of your nearest distributor.

Continuous handling of abrasive dust and steel shot calls for an exhaust hose of proven stamina. This Quaker hose has it. Even after 6 months of steady use by this grinding wheel manufacturer, it is still standing up to the wearing effects of abrasive particles—as compared to 6 weeks service by previously-used hose. It is specifically made for such tough service. Tube is specially compounded abrasive-resistant stock. Extra strength is provided by two plies of sturdy fabric and a helix of flat steel wire. Cover resists aging and is corrugated to give ready flexibility for bending around sharp corners. In lengths up to 50 feet. For lasting service specify Quaker-Quaker Pioneer exhaust hose.

HKP
H. K. PORTER COMPANY, INC.

H. K. PORTER COMPANY, INC.

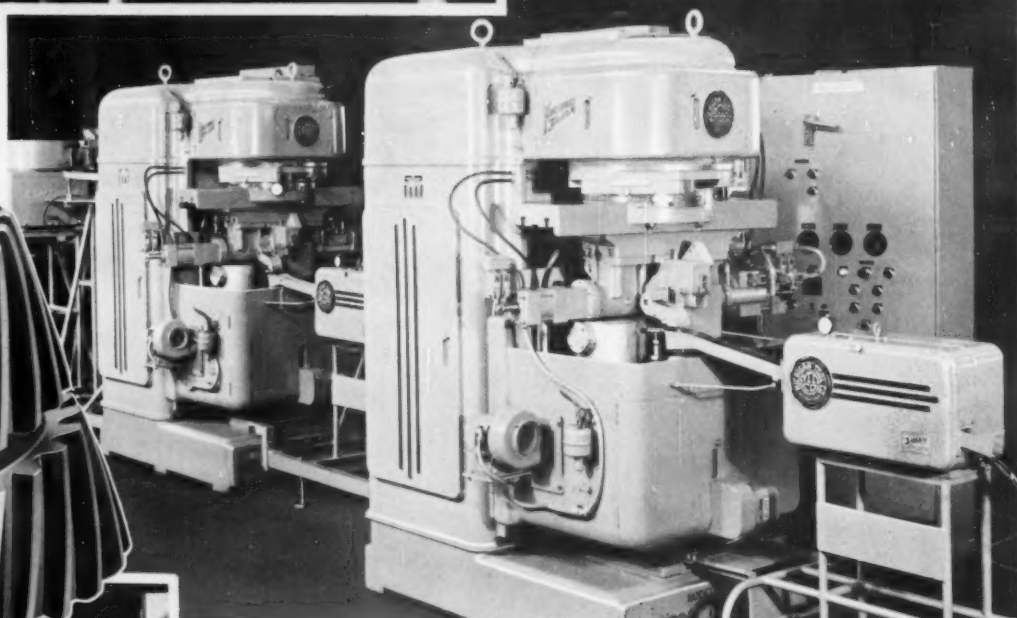
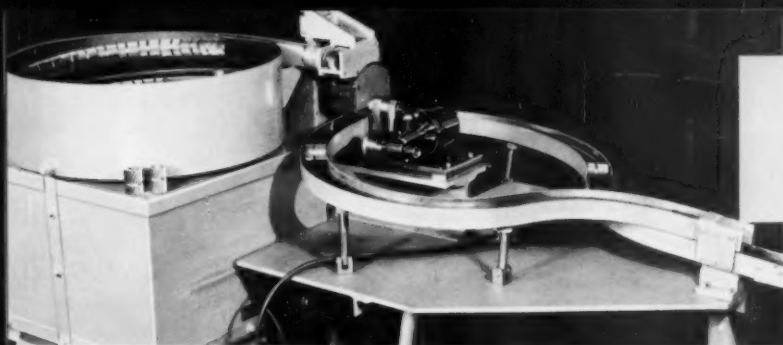
QUAKER RUBBER DIVISION

Philadelphia 24, Pa.

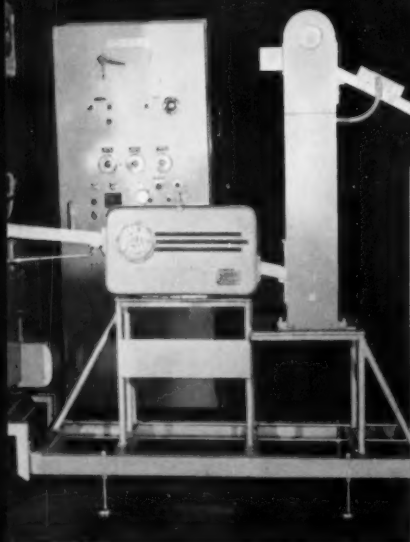
QUAKER PIONEER RUBBER DIVISION

San Francisco 7, California

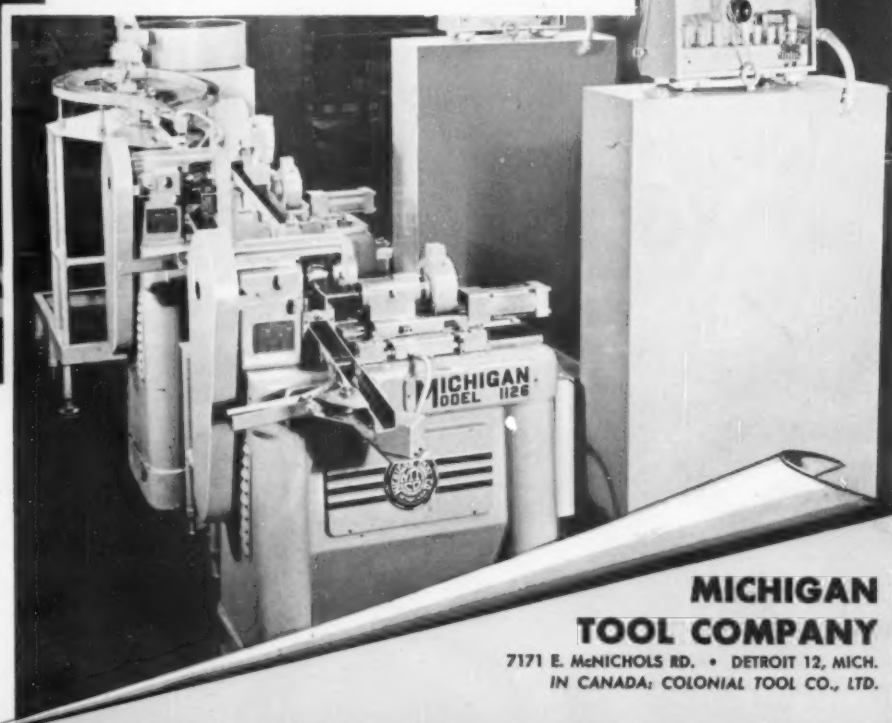
This Month's **GEAR PIX**



CYBERNETIC SHAVING. The double track from the loader at the top makes sure that the double gear is right-end-to as it goes into the first shaver. Each shaver has a controlling 3-WAY Michigan gear-classifier to accept or reject shaved gears before heat-treat and to automatically re-set machines when necessary. Elevator (left) re-loads gear into shaver #2.



FULLY AUTOMATIC SOUND TESTING follows heat-treat. These Michigan speeders (right) with tunable electronic audio-pickup eliminate variable human element in sound testing. Can be set to reject gears for excess noise in any desired pre-selected frequency band.



**MICHIGAN
TOOL COMPANY**

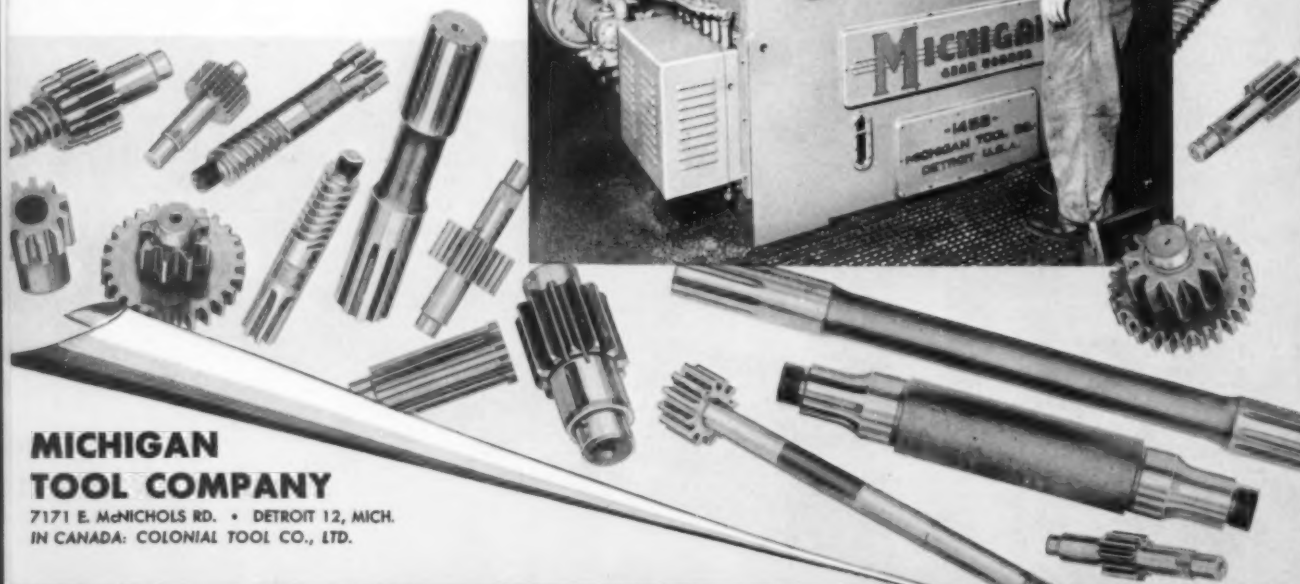
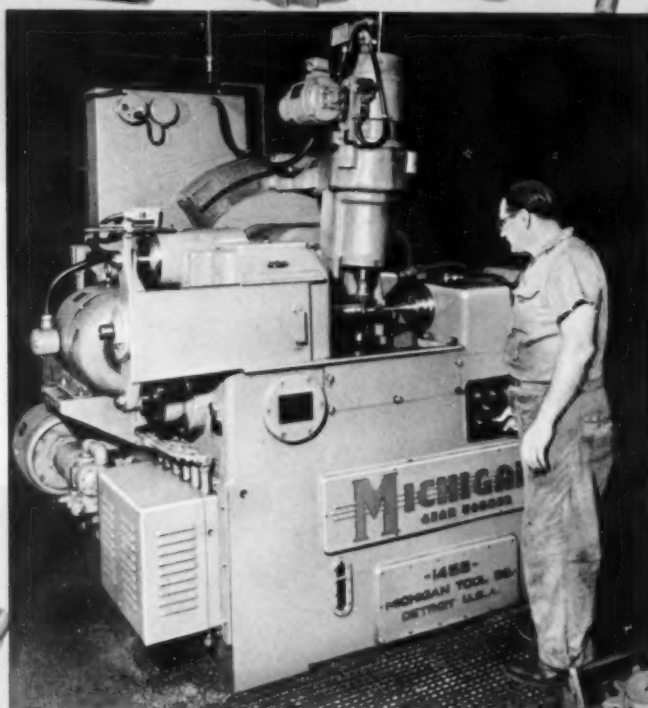
7171 E. McNichols Rd. • DETROIT 12, MICH.
IN CANADA: COLONIAL TOOL CO., LTD.

This Month's **GEAR PIX**



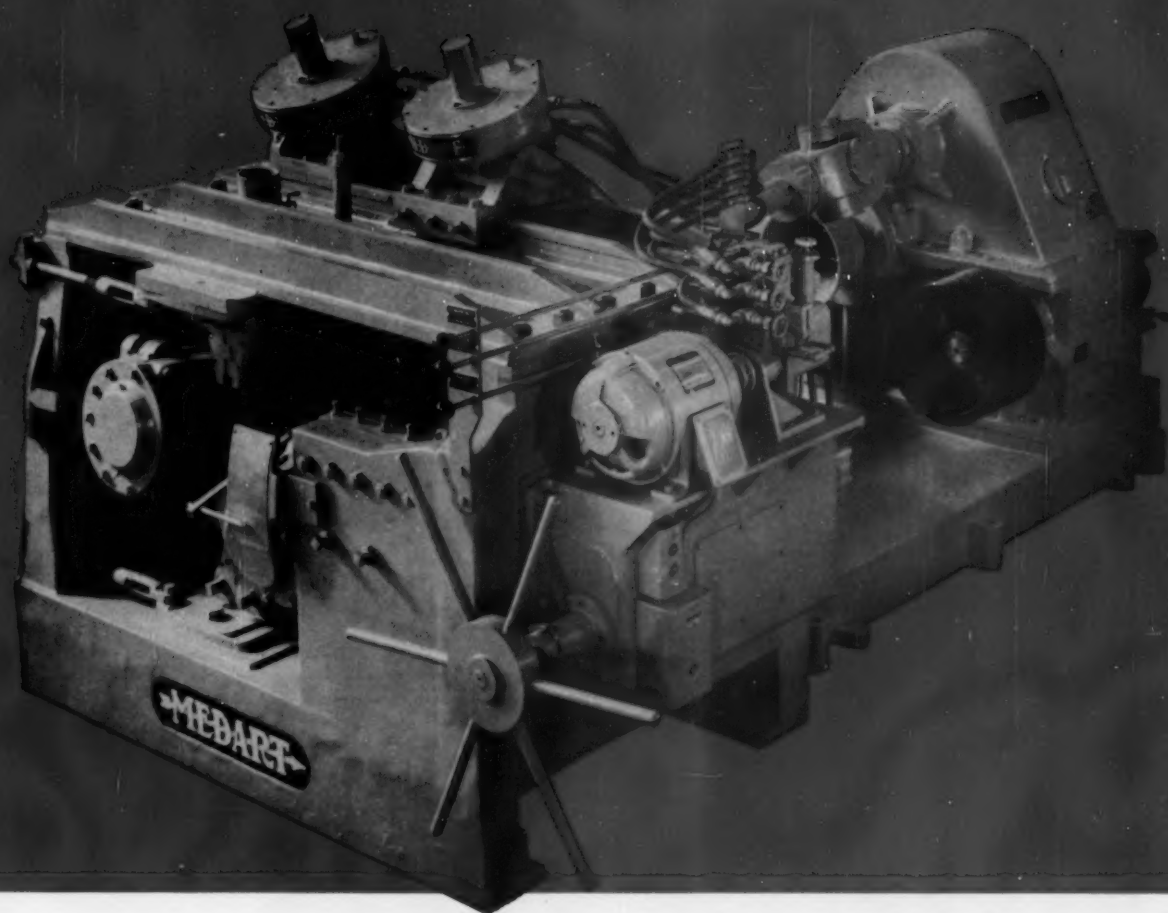
105 PARTS HOBBED ON JUST 3

Ultra-Speed hobbers regularly by a major lift-truck producer. Shows how high production machines can be used effectively for shorter runs. Hobbing is mostly at 250 sfpm (SAE4185) with far longer hob life and number of parts per grind. Change-over averages about 1½ hrs. (same as previously).



MICHIGAN TOOL COMPANY

7171 E. McNICHOLS RD. • DETROIT 12, MICH.
IN CANADA: COLONIAL TOOL CO., LTD.



BLAW-KNOX MEDART makes what it takes

for continuous, high speed straightening, sizing and polishing

You can meet the most rigid requirements for cold finishing round bars, pipes and tubes with a Blaw-Knox Medart 2-roll Rotary Straightener. Designed to perform with the greatest accuracy, it straightens, "super-finishes," and corrects out-of-roundness in one operation.

Processing begins the instant the workpiece enters the rolls and continues right up to the very end. Because of this you can straighten

short lengths as well as longer standard mill lengths. A modified straight roll then deflects the workpiece into the concave roll giving it a tremendous number of straightening cycles per foot, assuring precision straightening and sizing.

And this highly accurate finishing can be delivered at throughput speeds up to 350 ft/min. Operation is continuous by means of end-to-end feeding. The drive motor can be

reversed with the bar between rolls to permit additional passes for sizing and polishing.

The speed, versatility, and accuracy of Blaw-Knox Medart 2-roll Rotary's have made them the standard of the industry. Available in ten sizes, they can handle workpieces from 1/4" to 9" diameter. Contact us for detailed information, technical assistance or service.



BLAW-KNOX COMPANY
Foundry and Mill Machinery Division
 Blaw-Knox Building • 300 Sixth Avenue
 Pittsburgh 22, Pennsylvania



GOLD N RING



Units are available in flush-plate or enclosed mountings, and are adaptable for special panel assemblies.

New...

Oil-tight • Water-tight • Dust-tight

Protected against oil and water seepage by Sealtight oil-resistant rubber diaphragm. Rated for 600 volts, AC or DC. Meets requirements of Joint Industry Committee and National Machine Tool Builders' Association.

EASILY REPLACES EXISTING SWITCHES—Designed for mounting in $1\frac{13}{16}$ " diameter holes on standard panel mounting centers, this switch easily replaces existing switches. Accommodates panel thicknesses of $\frac{1}{16}$ " to $\frac{1}{4}$ " in $\frac{1}{32}$ " increments. Full interchangeability of units and their components permits ready adaptation to multiple assemblies.



Another product of...

National Acme

Sealtight CONTROL SWITCH

Made by machine tool builders to machine tool specifications

How often have you, when designing a machine tool, wished for a control station unit designed and constructed "as a machine tool builder would build it."

If you have been so handicapped in the past, you'll want to take a good close look at the NEW Namco GOLD-N-RING Control Station Switch Unit. Built by National Acme, builder of the world's only complete line of bar and chucking automatics, it is the *only* switch made by a machine tool builder with machine tool know-how behind it.

- It is a heavy-duty switch in every respect.
- It is oil-tight, water-tight, dust-tight.
- Heavy-duty silver-alloy contact points provide maximum electrical capacity and long life.
- Heavy-duty terminal screws, with $\frac{3}{8}$ " thread contact, prevent stripping during installation and permanently secure wires for continuous trouble-free service.
- None easier to install; none more fool-proof.

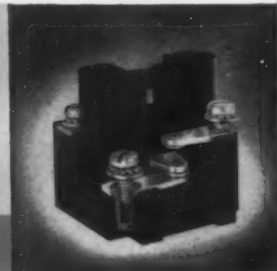
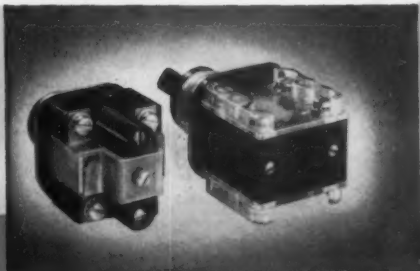
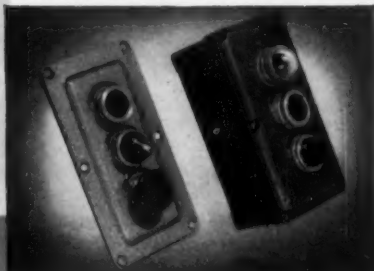
For complete details, send for Bulletin ECS-56. Better yet, ask for a representative to bring a switch for your examination.

Electrical Mfg. Division • THE NATIONAL ACME COMPANY • Cleveland 8, Ohio

▼ FLUSH PLATES OR ENCLOSURES accommodate any combination of individual push button, selector or pilot light assemblies. Box covers and flush plates are provided with captive screws to facilitate installation. Easy-to-read, interchangeable legend plates lock securely into position.

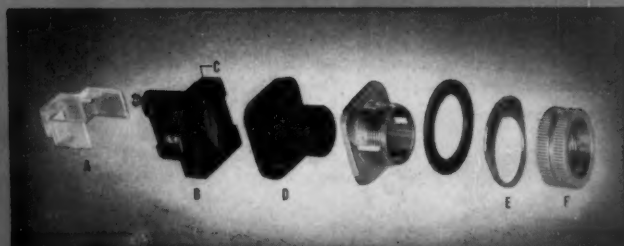
▼ SINGLE AND DOUBLE POLE CONTACT BLOCKS can be used interchangeably with the several types of GOLD-N-RING push button and selector operator heads. Design provides easy access for secure wiring (or use of stake-on lugs) without interference. Fixed and movable contacts are completely enclosed by heavy plastic shields.

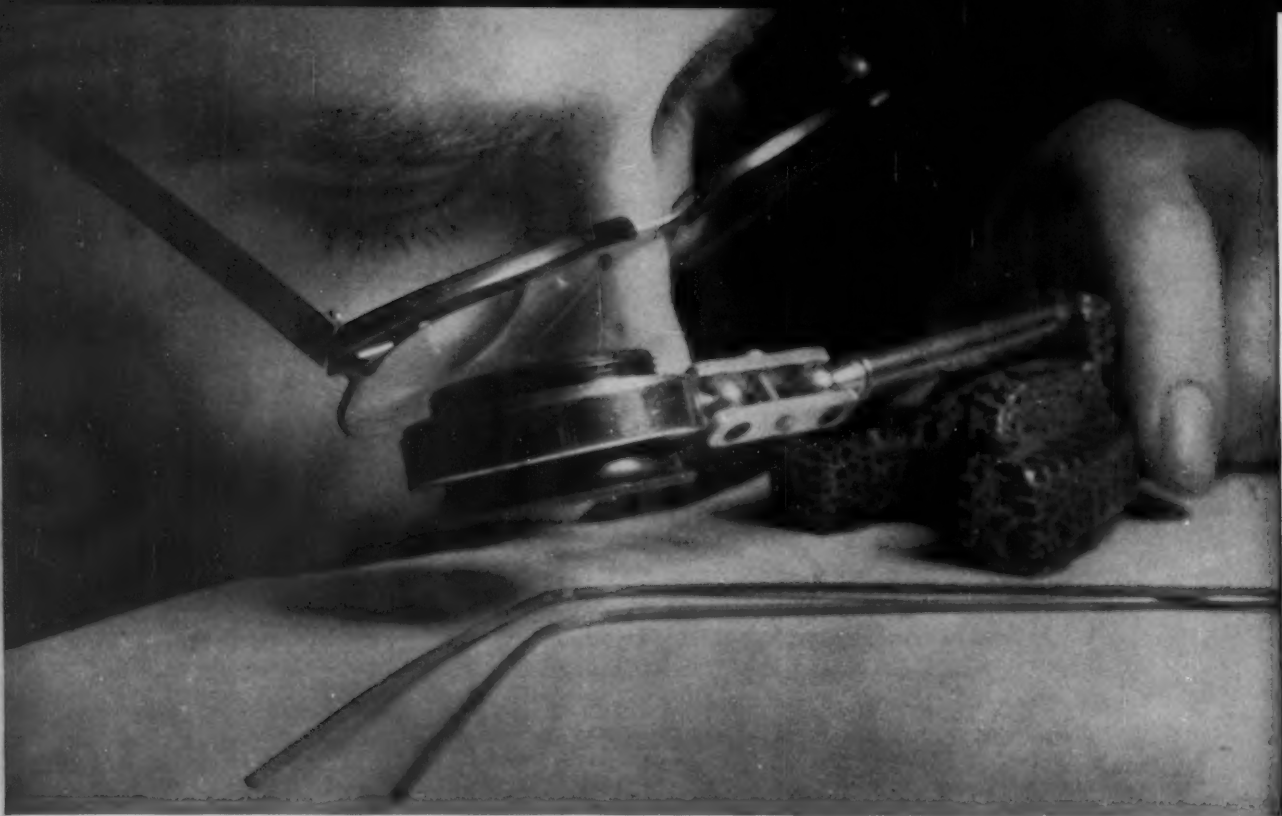
▼ BRASS INSERTS molded in block permanently hold stationary contacts. They also provide more thread support for the No. 8-32 terminal screws that are equipped with captive flat and lock type washers.



▼ BUILT AS A MACHINE TOOL BUILDER WOULD BUILD IT! Plastic shields (A) completely enclose contacts. Main block (B) is unit-molded to assure alignment and simplify assembly. Fully guided plunger (C) of cross-head design, prevents binding. Oil-resistant rubber diaphragm in operator head (D) completely seals out oil, water and dust. Easy-to-read legend plates (E) lock into position by "GOLD-N-RING" (F).

▼ INTERCHANGEABLE "GOLD-N-RING" COLLARS come in 3 different heights. Buttons can be made either extended or flush type merely by changing collar. Buttons are of non-fading glass-filled polyester and come in an assortment of colors to conform with standard codes.





The Connecticut Spring Corp. imposes rigid standards which Johnson Steel & Wire Co.'s Music Wire meets.

They Use Electronics To Build Steel Springs

Connecticut Spring Corporation Uses Johnson Music Wire To Do "The Impossible"

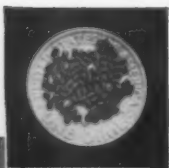


Photo shows 97 springs on a dime with plenty of room to spare, illustrates why The Connecticut Spring Corp. has introduced electronics into production.



What was long considered impossible in the intricate manufacture of precision steel springs—use of electronic production controls—is being done daily in the Hartford plant of The Connecticut Spring Corporation.

Electronics are being used in production of one spring so small that 100 of them fit on a dime easily.

Electronic devices are doing several production jobs for The Connecticut Spring Corp. to protect the company's reputation for quality.

But electronics, as company officials will quickly tell you, only measure quality, not create it.

Quality in a steel spring starts with the wire. That's why Connecticut Spring, one of the largest specialty fine wire users in the East, has been a Johnson Steel & Wire Co. customer since starting business 20 years ago.

"Our experience with Johnson wire has been satisfactory in every respect," says John A. Torda, general sales manager.

Electronic scanning of springs too



John Torda, sales manager, left, checks drawings to see that spring being wound meets specifications.

small to be measured manually is just one precaution the company takes. Its toughest job—a precision compression spring for the carburation system of a reciprocating aircraft engine—illustrates the firm's exacting emphasis on quality.

This aircraft spring weighs only half an ounce but controls the fuel flow in the engine.

The spring is tapered from a top O.D. of 1 inch to a bottom $\frac{5}{8}$ inch O.D. Free length is $1\frac{1}{2}$ inches with $8\frac{1}{2}$ coils. Made to Aircraft Material Specification 5112, the spring uses Johnson's .090 Music Wire.

Johnson conducts its own rigid inspection before shipping from its Worcester, Mass., mill to certify the wire meets AMS demands.

Connecticut Spring could get by on this certification. Instead, it conducts its own complete test of physical properties and then trial runs a sample piece of wire from each lot. During production, it runs several inspections, including two load value tests on five different check points.

The aircraft spring goes through heat treating and brazing operations. It must meet precise load specifications, thus its tensile strength must be exact. Specifications permit only one degree of squareness. Load values have a plus or minus tolerance as limited as .003 to .008. A battery of testing devices makes certain these specifications are met or surpassed.

Connecticut buys every size range



Numerous quality tests are performed on the aircraft spring to insure that it can perform its vital function in plane's fuel system.

of Johnson's Music Wire, starting at .003 and going to .300.

For its complete product line, Connecticut relies on both Johnson and its parent Pittsburgh Steel Company. The wire mills of Pittsburgh Steel have become major supplier of hard-drawn MB wire used to make double counter-balance springs for steel cellar doors. Pittsburgh also supplies oil-tempered MB wire for transformer base mounting springs.

Whatever the wire application, Johnson Steel & Wire Company and Pittsburgh Steel Company can serve you. From aircraft cord wire to tire bead wire made by Johnson through oil-tempered, hard-drawn, low-carbon or core wire from Pittsburgh Steel, the team of wire specialists stands ready to serve you. Call in a wire specialist from Johnson or Pittsburgh today for a talk about your wire problems.



Pittsburgh Steel's hard-drawn MB wire is used by Connecticut Spring for cellar door counter balance door spring. Here wire gets two bends.



Three coils are wound into each side of spring. Pittsburgh Steel has been major supplier for this product since production started.



Ready for installation. Tensile strength of wire (Pittsburgh's .218) is vital. Connecticut Spring has no complaints on wire quality.

Johnson Steel & Wire Company, Inc.

Worcester 1, Massachusetts

a subsidiary of Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.



District Sales Offices

Atlanta
Chicago
Cleveland

Columbus
Dallas
Dayton

Detroit
Houston
Los Angeles

New York
Philadelphia
Pittsburgh

Tulsa
Warren, Ohio



Easy to Mix. Just add water according to instructions. Mixes in about five minutes.

Consistency of Mix is as workable as any cement mix.

Pours Readily into any prefabricated form.

New ALUNDUM* 33-I insulating castable...mixes and pours like concrete...protects to 3300°F.

A New Norton Refractory R_x

Now you can protect critical areas in your furnaces and other high temperature equipment to 3300°F with ALUNDUM 33-I insulating castable — a new, easy-to-install NORTON Refractory Product.

- 33-I comes in dry form in moisture-protective bags.
- 33-I — You just add water according to instructions. Mixes readily.
- 33-I pours into any prefabricated form like a concrete mix.

And . . .

- 33-I insulates up to 3300°F.
- 33-I is light in weight and monolithic in structure.
- 33-I saves down time for repairs.

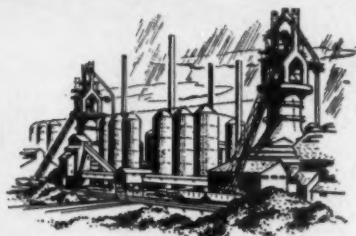
Characteristics

| | |
|-------------------------------------|----------------------|
| Density..... | 100 lbs. per cu. ft. |
| Setting up time | |
| Stiffens..... | 1 hr. |
| Initial set..... | 4 hrs. |
| Final set..... | 18-24 hrs. |
| Chemical Analysis — Al_2O_3 | Primarily |
| SiO_2 | < 0.1% |
| Fe_2O_3 | < 0.1% |
| Maximum hot face temperature..... | 3300°F |
| Water added per 100 lbs..... | Approx. 2 1/4 gals. |
| Grain Size..... | .6F |

This newest Norton refractory R_x is engineered and prescribed for maximum protection and quick, easy installation in a wide range of uses. For further facts on ALUNDUM 33-I insulating castable, write to NORTON COMPANY, Refractories Division, 208 New Bond Street, Worcester 6, Mass. Canadian Representative: A. P. Green Fire Brick Co., Ltd., Toronto, Ontario.

*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

Typical Applications in Metal Processing

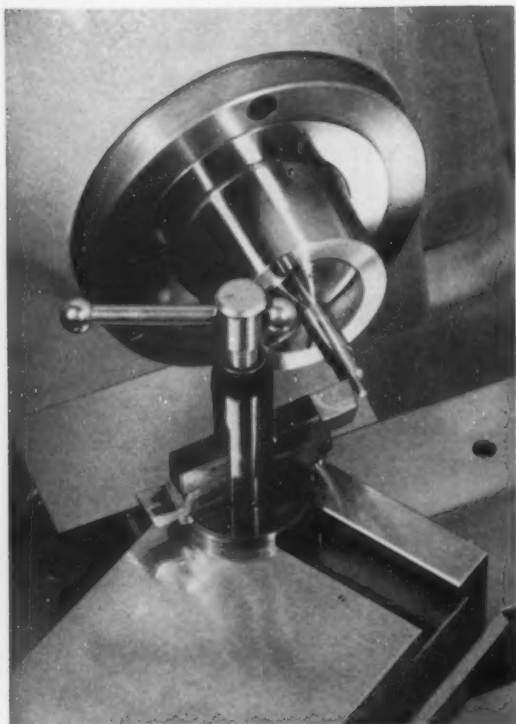


Linings for atmosphere furnaces. Insulation for pit furnace linings.

NORTON
REFRATORIES

Engineered... R_x ...Prescribed

*Making better products...
to make your products better*



When



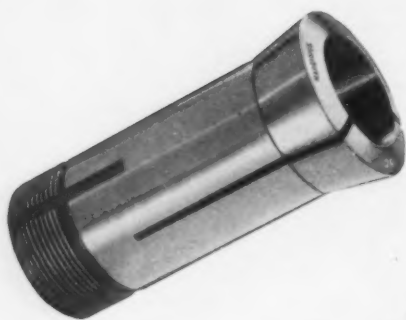
ACCURACY

REALLY COUNTS

SPECIFY:

HARDINGE

**PRECISION
DRAW-IN COLLETS**



**FOR YOUR
LATHES-MILLERS-GRINDERS**



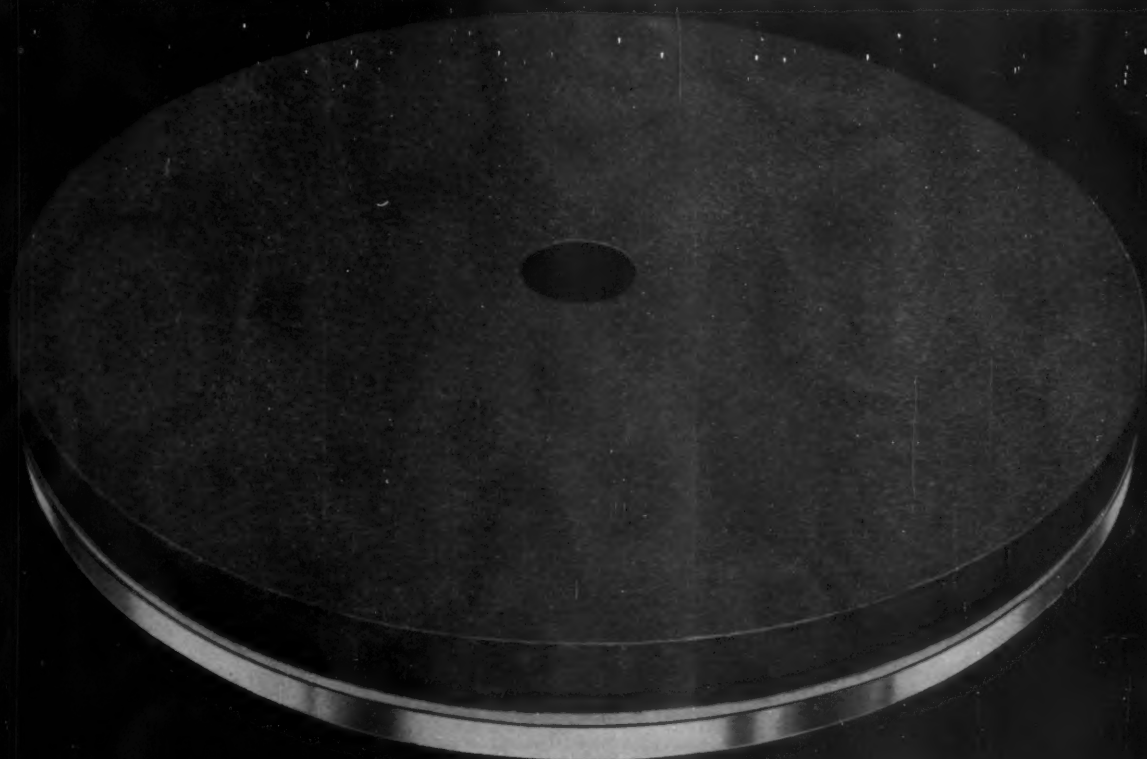
CARRIED IN STOCK FOR PROMPT DELIVERY IN:

Baltimore, Chicago, Dayton, Detroit, Elmira, Hartford, Los Angeles, Minneapolis, New York,
Oakland, Philadelphia, St. Louis, Toronto, and Montreal

HARDINGE BROTHERS, INC., ELMIRA, N. Y.

46% more disc life after changing to Gardner

**Reduces down time,
lowers unit cost**



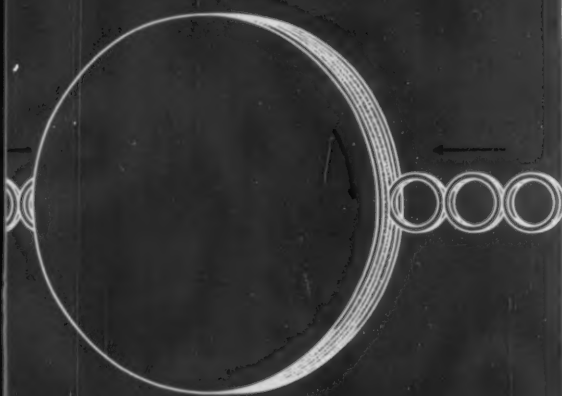
the problem:

To increase disc life in double disc grinding parallel sides of bearing races of various sizes.

the solution:

Gardner Abrasive Specialist recommended new specification which produced an average of 280,000 pieces per set of discs, compared to 191,000 per set of discs previously used.

GARDNER
abrasive discs
BELOIT, WISCONSIN



*Precision grinding both sides of
bearing races in one operation.*

when stopping DC Motors

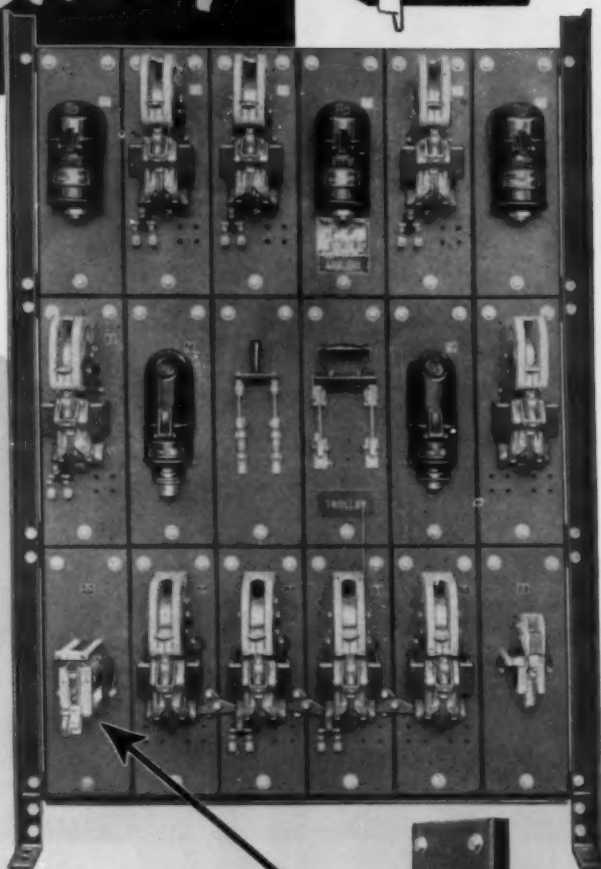
EC & M's Rectifier Plugging Control System gives

FULL PROTECTION!



• This is the simplest of all plugging control systems for D.C. mill and crane drives. Only a small rectifier and single-coil mill-duty relay are required. They are connected across the motor armature for operation by counter-emf. The relay allows the plugging contactor to close immediately when starting from rest. When reverse-power plugging is applied to stop the motor, the rectifier permits the relay to pick up and hold open the plugging contactor. As the motor reaches stand-still, the relay drops out to close the plugging contactor and to allow acceleration in the opposite direction.

TWO-STEP PLUGGING CONTROLLERS are available for use on heavy inertia loads such as ore bridge trolleys and ladle crane bridge motions. Ask an EC&M Engineer to explain the improved operation of D.C. motors by Rectifier Plugging.



HERE'S WHY EC&M GIVES MOTOR DRIVES BETTER PROTECTION

- ✓ **POSITIVE RESPONSE** • Relay operates directly from counter-emf of motor.
- ✓ **RELIABLE OPERATION** • Unaffected by line voltage variation. Unaltered if taps on accelerating or plugging resistors are changed.
- ✓ **FULL PROTECTION** • Relay picks up at any speed above 10% of F. L. motor speed. Drop-out occurs as motor reaches standstill.
- ✓ **SIMPLICITY** • Single-coil relay and small rectifier. No electrical interlocks.
- ✓ **LESS MAINTENANCE** • Relay does not require adjustment-maintenance.

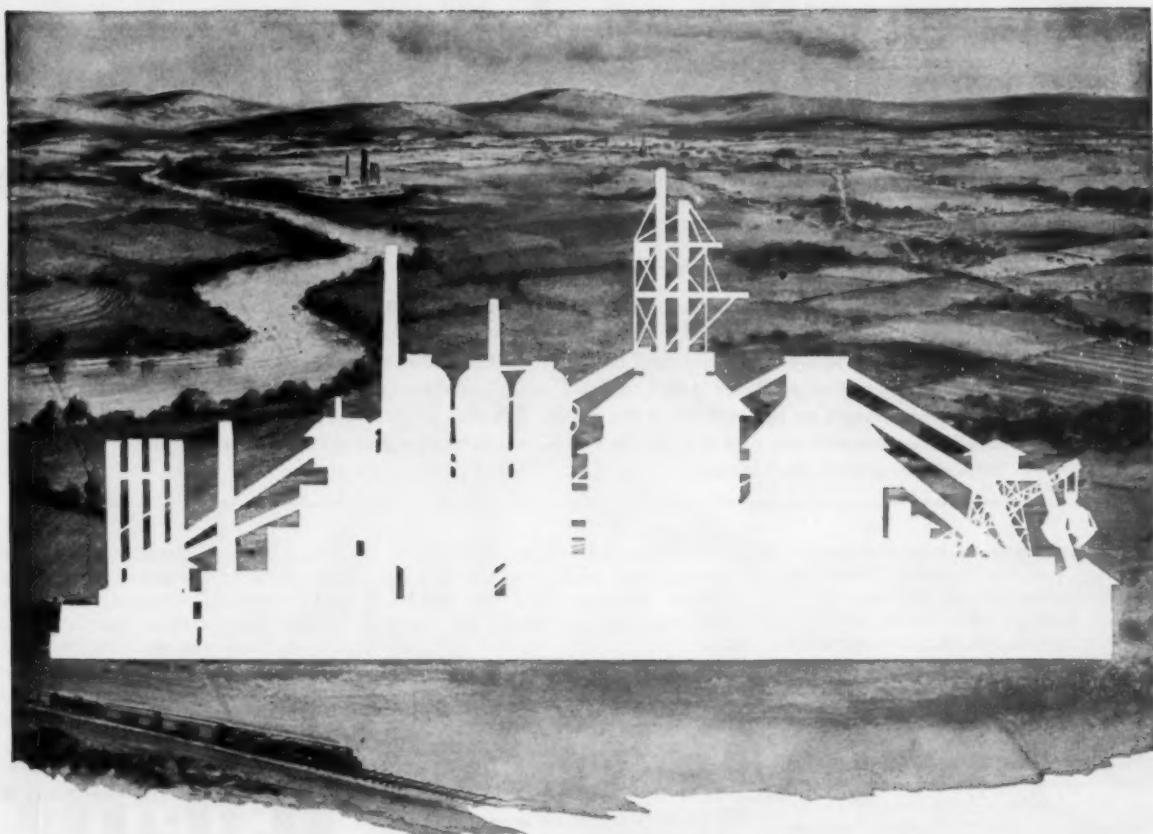
View of Type FKP Relay
used on EC&M
D-C Magnetic Controllers



SQUARE D COMPANY

EC&M DIVISION • CLEVELAND 28, OHIO

7406



There's a place for a Steel Mill on the N&W

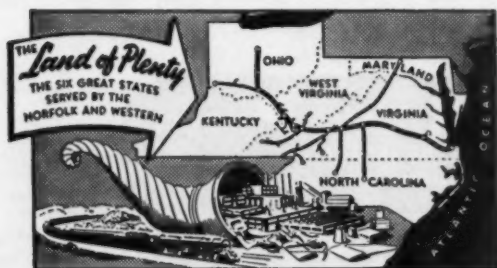
Write, Wire or Call:

L. E. WARD, JR., Manager
INDUSTRIAL AND AGRICULTURAL DEPT.
 Drawer 1A-728 (Phone 4-1451, Ext. 474)
Norfolk and Western Railway
ROANOKE, VIRGINIA

In the Land of Plenty you can build a steel mill virtually on top of almost unlimited supplies of the world's finest Bituminous Coal and high-calcium limestone. And you can avail yourself of short-haul advantages in transporting ore from the strategically located Port of Norfolk.

The water needed for steel production, on any logically conceivable scale, is available here, too.

Recent scientific studies have revealed some startling facts about the Land of Plenty in regard to its advantages for the steel industry. We invite you to contact our plant location specialists for detailed information, which will be furnished in confidence and without obligation.



Norfolk and Western RAILWAY

Facts to consider when you're buying

Chromate Conversion Coatings

for Corrosion Protection, Paint Base, Decorative Finishing

WHAT IS IRIDITE®

Briefly, Iridite is the trademark for a specialized line of chromate conversion finishes. They are generally applied by dip, some by brush or spray, at or near room temperature, with automatic equipment or manual finishing facilities. During application, a chemical reaction occurs that produces a thin (.00002" max.) gel-like, complex chromate film of a nonporous nature on the surface of the metal. This film is an integral part of the metal itself, thus cannot flake, chip or peel. No special equipment, exhaust systems or specially trained personnel are required.

If your company is manufacturing or buying parts or complete assemblies made from or plated with any of the more common non-ferrous metals—zinc, cadmium, aluminum, magnesium, silver, copper, brass or bronze—you've probably already run up against the question of finishing these surfaces with a chromate conversion coating. These coatings are used to protect against corrosion, or to provide a base for paint or to provide a decorative finish for sales appeal or shelf life. Since chromate conversion coatings represent a relatively new means of obtaining these finishes, this digest of facts to consider may be of value to you.

1. THE COATINGS THEMSELVES.

There are many brands on the market. All are similar in many ways. Each, of course, offers its own specific advantages and these may relate to operating techniques, performance under actual use conditions, cost, availability, etc. Naturally, you'll want to choose a coating that is widely known and accepted under both military and civilian specifications.

2. THE COMPANY BEHIND THE PRODUCT.

Is it a reliable, established organization? Does it offer experienced technical service, both from the field-engineering organization as well as the home office and laboratories? The man who sells and services your installation should be thoroughly familiar with not only chromate conversion coatings and their applications, but also with the characteristics and performance of related finishing operations such as pre-cleaning, electroplating, painting, etc. This is most important since all steps of the finishing cycle must be functioning properly for the satisfactory performance of the ultimate finish produced.

3. AVAILABILITY OF THE PRODUCT.

Ideally, of course, the material should

be readily available to you from nearby warehouses to avoid time loss in long distance shipping and to provide emergency service, should the need arise.

4. COST. Naturally, the initial price of the material is important to you. However, just as you consider ultimate cost when you are buying mechanical equipment, ultimate cost must be considered for these finishing chemicals. So, it will pay you to investigate consumption costs, labor costs and the other factors which go into the determination of ultimate cost. Further, cost alone gives no indication of product performance, so careful attention must be given to the purpose the finish must serve and the value that finish will add to your product.

5. FACILITIES FOR RESEARCH AND DEVELOPMENT.

Perhaps the existing types of chromate conversion coatings do not include a compound that will accomplish exactly what you wish. Then, it is important to deal with a supplier who has adequate research and development facilities available to work with you to produce a material to meet your needs. Naturally, such a project is seldom completed overnight. But, with complete cooperation and confidence from both you and your supplier, chances are a satisfactory program can be completed.

These are the concepts of sales and service on which we, Allied Research

Products, Incorporated, have developed and marketed the line of Iridite chromate conversion coatings... superior product performance, complete sales and technical service, easy product availability, economical cost, extensive research and development facilities. No doubt you are familiar with our line and have seen this trademark—

IRIDITE®

—in our advertising, technical literature or on shipping containers in your plant. Remember this trademark when you're buying or investigating chromate conversion coatings for your company. It's your assurance of quality, economical products from a reliable and established company, skilled sales and technical service from both our home office and a national network of representatives, immediate availability from warehouses in strategic industrial areas and our willingness to work with you to develop new finishes to meet your needs, should the present line fall short.

For complete information on Iridite chromate conversion coatings, write today for your free copy of our technical data file. Or, for immediate advice, call in your Allied Field Engineer. He's listed under "Plating Supplies" in your classified telephone book.

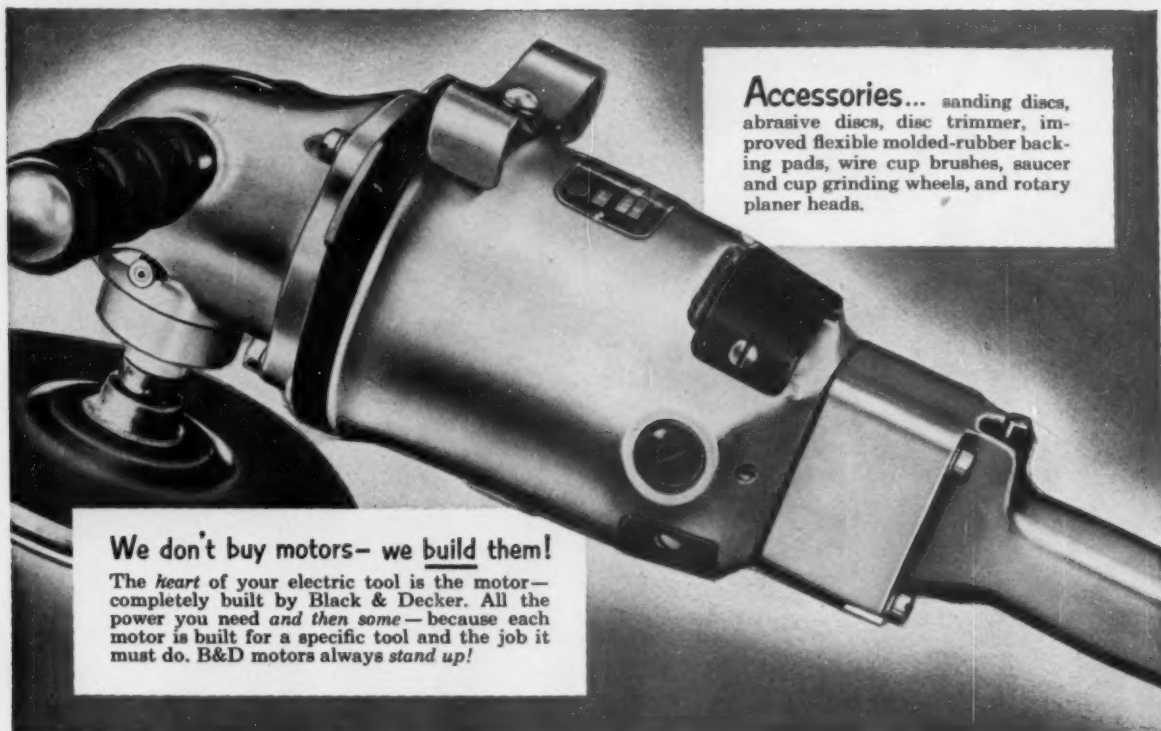
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Manufacturers of Iridite chromate conversion coatings for corrosion resistance, paint systems, final finishing of non-ferrous metals; ARP Plating Brightener & Chemicals. West Coast Licensee—L. H. Butcher Co.

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Accessories... sanding discs, abrasive discs, disc trimmer, improved flexible molded-rubber backing pads, wire cup brushes, saucer and cup grinding wheels, and rotary planer heads.

We don't buy motors— we build them!

The heart of your electric tool is the motor—completely built by Black & Decker. All the power you need *and then some*—because each motor is built for a specific tool and the job it must do. B&D motors always *stand up!*

For Sanding, Grinding, Burnishing, Wire Brushing!

Nearly *twice the power* of previous models and *higher spindle speeds* of either 5200 or 6000 rpm—these make the rugged Black & Decker 7" Sander-Grinder the ideal tool for continuous, heavy-duty use. Yet it's easier to handle and reduces operator fatigue because it's lighter.

Motor housing is protected from heavy abuse and is contoured to direct exhaust air away from the operator. Ball-bearings are lubricant-sealed. Switch is guarded from accidental operation. The 7" Heavy-

Duty Sander-Grinder is one of the complete line of Black & Decker Electric Tools . . . *Power-Built* to increase your output and lower your labor costs. See your B&D distributor today or write: THE BLACK & DECKER MFG. Co., Dept. 7809, Towson 4, Maryland.

Look in the Yellow Pages under "Tools-Electric" for Nearest Distributor

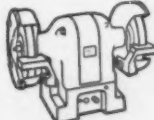


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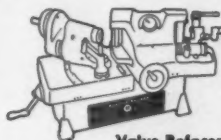
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4 Bench Grinders



2 Vacuum Cleaners



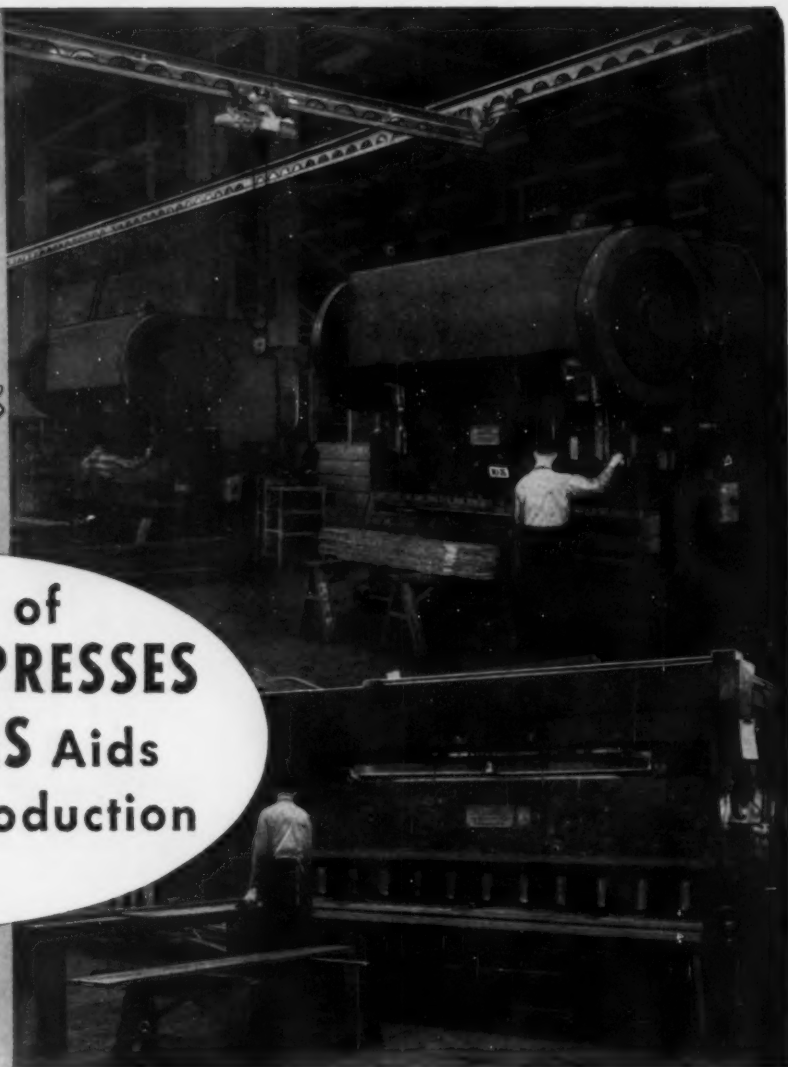
Valve Refacer

Two of the Steelweld Presses in action. These are Model KS-10 machines rated for 12'-0" x 3/4" steel plate. Note how Cleveland Tramrail cranes serve these presses.



Battery of STEELWELD PRESSES and SHEARS Aids Caterpillar Production

Shearing long 1/2-inch thick strips into small rectangles on a Series 8D-10 Steelweld. The long extension squaring arm at front facilitates this work.



THOUSANDS of tons of steel of different thicknesses are sheared and formed on Steelweld Shears and Presses into various shapes required for the large volume of tractor equipment produced at the new Joliet, Illinois, plant of Caterpillar Tractor Co. These items include scrapers, rippers, bulldozer blades and wagons.

The heavy construction of Steelweld machines and many high quality features with which they

are provided make possible continuous trouble-free performance. Their design includes a number of innovations which ease operation, speed production and enable accuracy to close tolerances.

The fact that Caterpillar has bought Steelweld Shears and Presses repeatedly and now has a large battery of them is mute testimony to the satisfaction they are giving.

GET THESE BOOKS!

Catalogs No. 1010 (Presses) and No. 1011 (Shears) give construction and engineering details. Profusely illustrated.

THE CLEVELAND CRANE & ENGINEERING CO.

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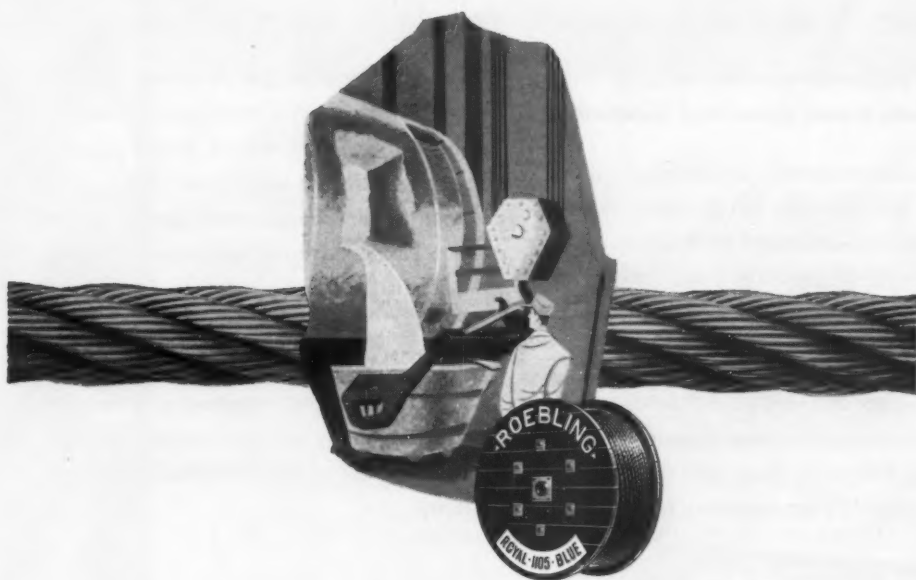
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Roebeling's finest!

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vastly increases...even doubles...
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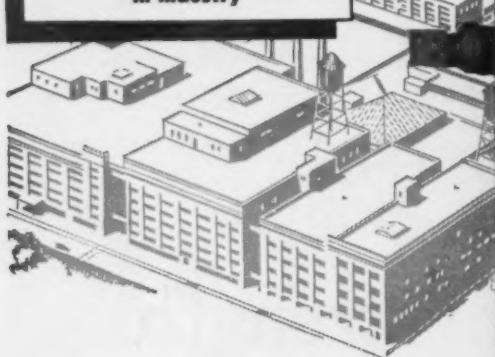
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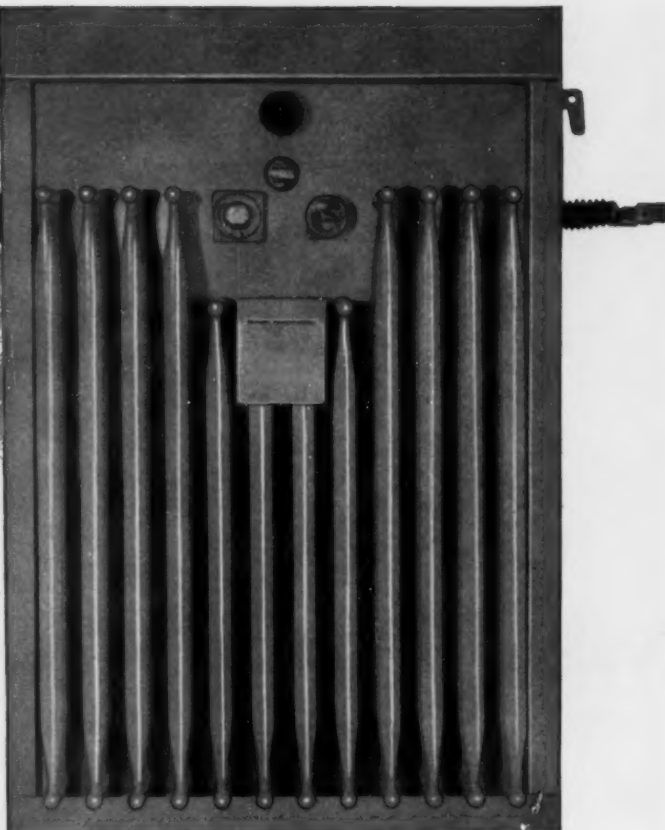
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you can build a compact, modern unit substation**

These Unit Substation Transformers save space... make a neat, streamlined installation

Wagner close-coupled, liquid-filled unit substation transformers can be easily flush-mounted with co-ordinated switchgear. And when they are, the result is a neat, modern, compact installation that not only saves space in your plant, but looks better too.

You get quicker delivery on a close-coupled Wagner transformer because there are fewer engineering difficulties than with the throat-connected type. It's not necessary to co-ordi-



nate the bushing height of a close-coupled unit to match special switchgear. Bushing heights are designed to give ample room to make connection to switchgear or busses in the switchgear compartment or transition section. No need for special throats to match special switchgear.

Look to Wagner for transformers that assure a continuous dependable flow of power. Your nearby Wagner engineer will be glad to help you solve your load-center problems. Call the nearest of our 32 branch offices or write us.



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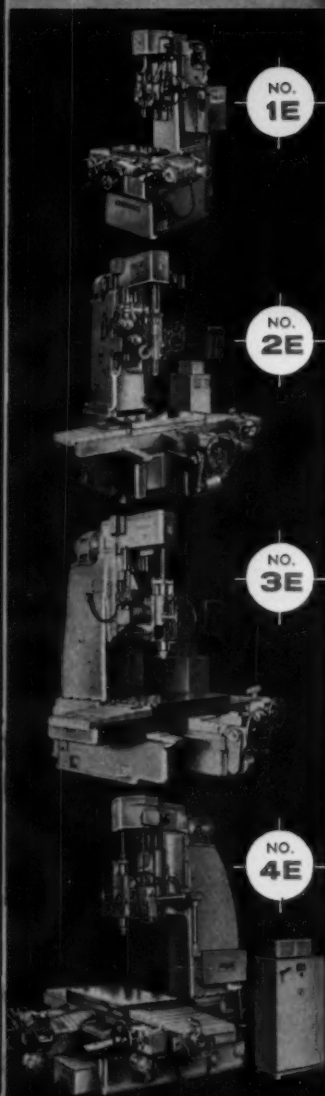
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The point we'd like to make is that Pratt & Whitney Electrolimit Jig Borers incorporate an exclusive method of locating the table that is *unbeatably* fast and convenient . . . and accurate to .0001". Thanks to the P&W Precision Preloaded Ball Roll Quill, you'll be able to retain original accuracy and rigidity *indefinitely* without any adjustment or maintenance.

And there'll never be any loss of accuracy from wear.

NOW . . . Pratt & Whitney Electrolimit Jig Borers can also be furnished with positioning control by NUMERICAL DATA.

. . . COMPLETE LINE includes table sizes from 12"x24" to 36"x72".

Write for free copy of P&W Electrolimit Jig Borer Circular No. 587 . . .

ALSO FURNISHED . . . a full line of Pratt & Whitney End Measure Jig Borers which also deliver "tenths" accuracy year after year.



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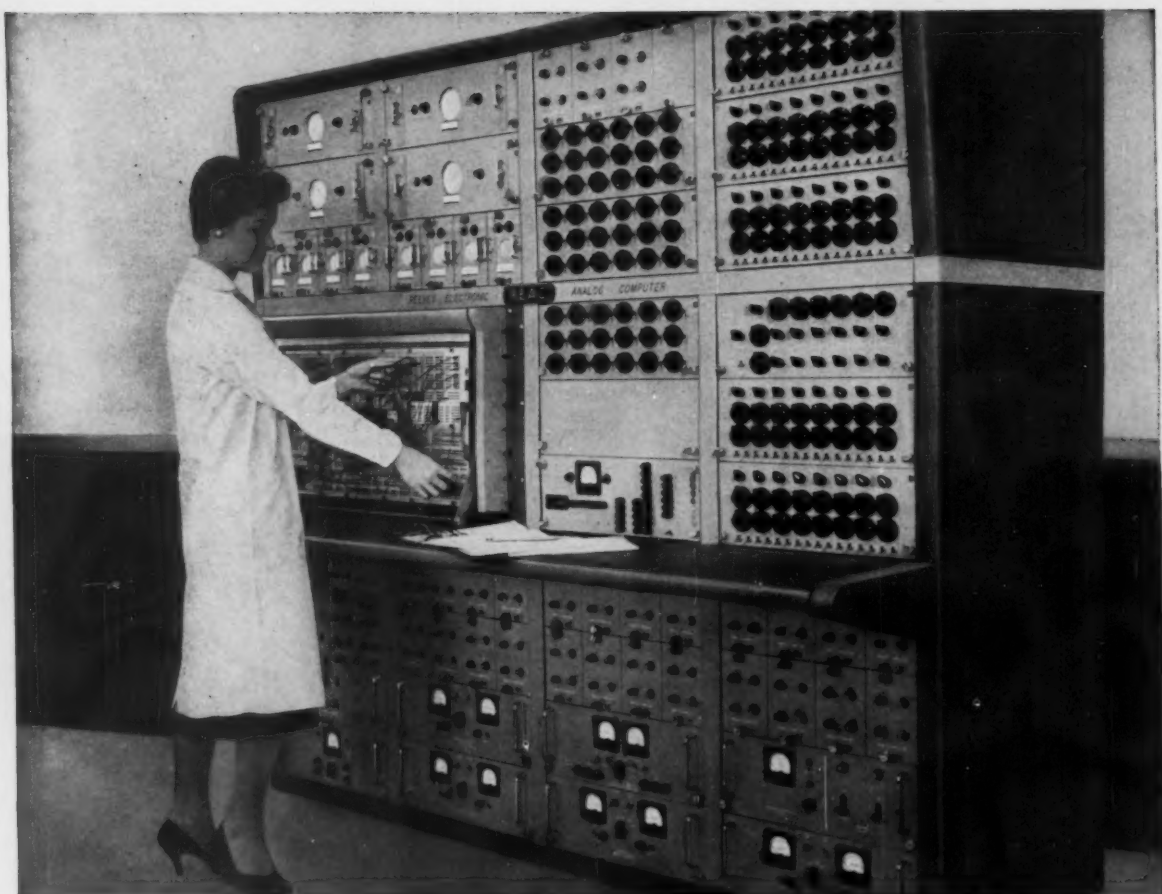


Photo courtesy of Dynamics Corporation of America

Electronic "brains" rely on **COPPER!**

Today, electronic computers pre-test the performance of guided missiles . . . forecast next year's sales . . . build safer bridges . . . and guide 5,000 freight cars a day through the mazes of 65 trunk lines in a single railroad yard.

You simply dial your instructions to these modern computers; they obey faster than thought.

But they need *copper* to operate.

Like nerves to the human head, copper wires transmit impulses to and from electronic "brains". Other vital computer parts are of copper, too.

Perhaps your product doesn't need to "think" . . . just *act*. Make it of copper and you make sure of performance no substitute can equal.

A typical "brain" puts copper and its alloys to many uses.

| | |
|---|---|
| Copper | Used in various forms, tempers, sizes for lead-ins to transistors, for lead-outs and wave-guide tubes. All wiring is copper, of course, 10 to 20 miles of it! |
| Beryllium copper Phosphor bronze | Beryllium copper is used because it provides excellent elastic and fatigue properties when heat-treated; phosphor bronze because of its exceptional spring qualities and resistance to wear. Both have properties which make them ideal for the 11,000 essential spring contacts. Torsion bars, clips, probes, and shafts also use these copper alloys. |
| Aluminum bronze Manganese bronze Naval brass | Used for gears, bearings, bushings, clamps, and structural parts. |
| Brass | Used for screw machine products, gears, hardware, fittings, springs, pins, and wherever soldering or brazing must be done. |

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Easy to machine, form, draw, stamp, polish, plate, etc.



Welds readily . . . excellent for soldering and brazing



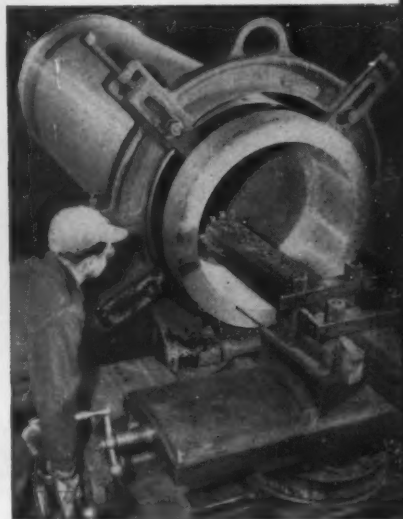
BARIUM STEEL—active in America's growth



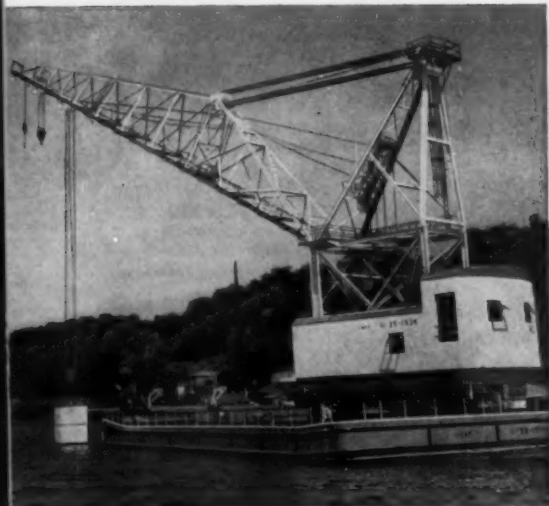
HIGHWAY CONSTRUCTION won't be slowed down by waterways as long as Barium's Phoenix Bridge Company fabricates steel and builds bridges. This handsome 500 foot, 900-ton continuous deck plate girder highway bridge, was built by Phoenix for the New York State Department of Public Works. It spans the Susquehanna River at Bainbridge, New York.



PROCESS PLANT builders shop at Barium, too. This large Gas Scrubber Separator unit (at left) was fabricated by the Plate Division of Barium's Phoenix Iron & Steel Company. Too big to go by railroad, a special truck rig delivered it to the job site at Farrel, Pa.



CHEMICAL INDUSTRIES take advantage of the alert management thinking that has built Barium from 1 to 12 soundly diversified companies in ten short years. Here at Barium's Industrial Forge & Steel Inc., they're rough machining a 7900 lb. carbon steel forged sleeve for a leading chemical concern.



ARMED FORCES have learned what we mean by Barium's integrated operations. Though the Air Forces' biggest (50-ton design capacity) floating crane bears the nameplate of Barium's Wiley Manufacturing Co., four separate Barium companies pooled talents to produce it. Just one more chapter in "The Barium Story"—complete product listing is in Thomas Register, Section A to Z.

4.1

AUTOMOBILE gears, shafts and shifters are pounded out on hammers at Barium's Globe Forge, Inc. Automotive springs, fasteners and stampings come from other Barium companies. For more facts on Barium, write Barium Steel Corporation, 25 Broad Street, New York 4, N. Y.



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Phoenix Iron & Steel Co. (Plate Div.; Structural Div.; Steel Tube Div.; Blast Furnace Div.)

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CLARK AISE-NEMA BRAKE

Bulletin 106, Type "B"

with many exclusive features for

- MORE DEPENDABLE OPERATION
- EASIER MAINTENANCE
- GREATER SAFETY

This new line of CLARK Bulletin 106, Type "B" heavy-duty DC brakes conforms completely to AISE-NEMA standards. Economies in overall size are achieved without sacrificing ruggedness or dependable operation. The new design retains the famous "nut-cracker" principle of former Clark brakes, which assures equal distribution of applied pressure. And it incorporates many entirely new features for greater safety and easier maintenance.

The first of these new brakes to be available is the 13-inch wheel size illustrated. Other sizes to follow.

features...

- Equal distribution of shoe pressure against wheel
- New simpler and easier method of replacing shoes
- All maintenance adjustments made from the top
- Single adjustment for air-gap. Built-in indicator
- Magnet can be removed and replaced without disturbing brake adjustment or releasing the brake
- Coil replacement easily accomplished on the job
- Wheel and motor armature removable as a unit without disturbing brake adjustment
- Cast steel construction—cast aluminum shoes

—and many others

See this brake demonstrated at the Iron and Steel Show,
Booths 89, 90, 111 and 112.

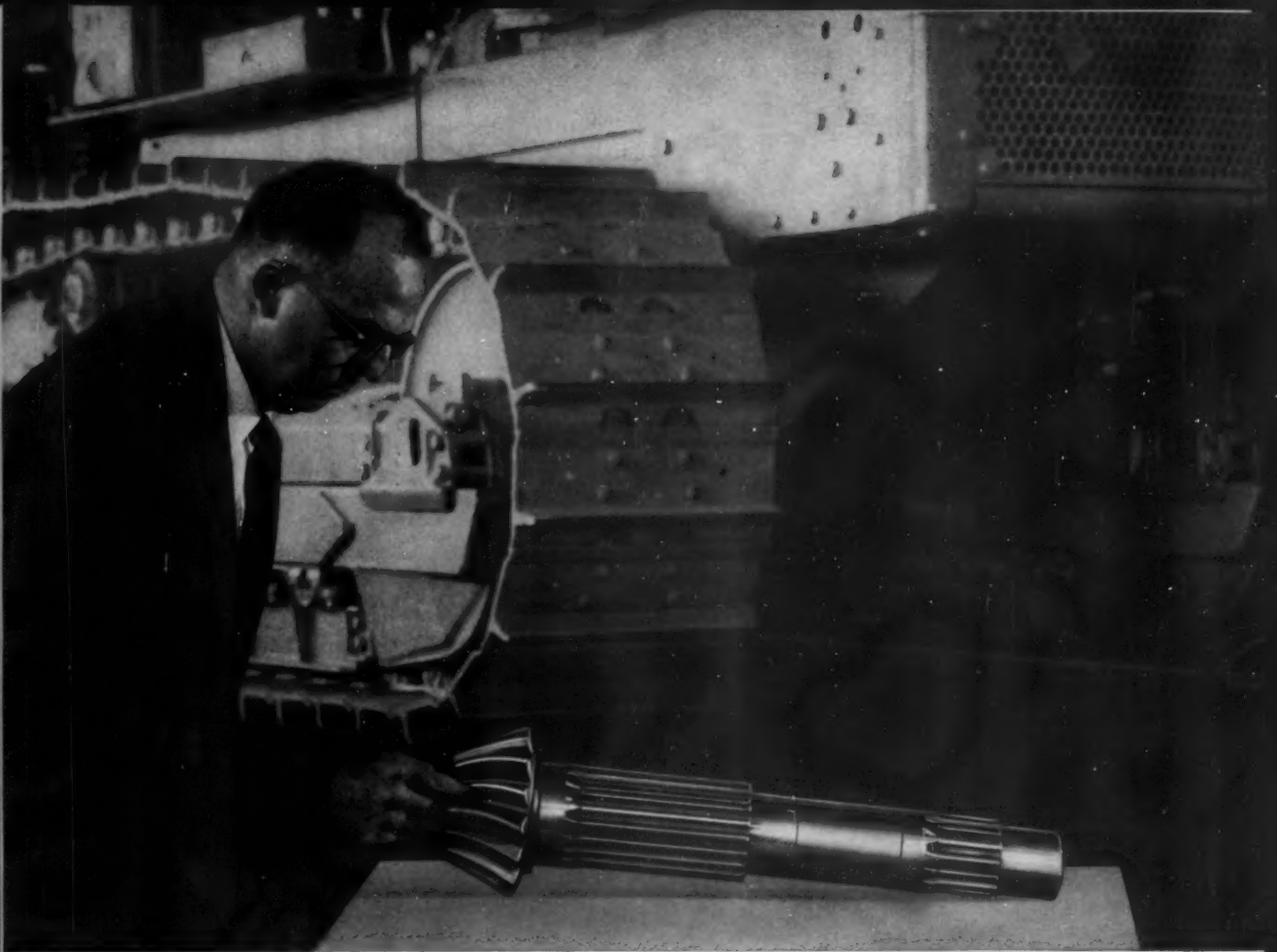
The **CLARK**
Engineered Electrical Control



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Caterpillar Tractor Co. Metallurgist T. H. Spencer inspects final drive pinion for D9 crawler tractor weighing 28 tons. Severe loading of this large pinion requires a steel with high case and core hardenability. Several years ago

Caterpillar Tractor Co. found that simply by increasing the molybdenum content of AISI 8622 (to 0.30-0.40%), the desired properties were obtained at lower cost than was possible in any of the standard carburizing grades.

Caterpillar Tractor Co. improves case and core hardenability of carburizing steel by increasing molybdenum content

"Drive pinions in tractors must take very high torque loads," says T. H. Spencer, Metallurgist for Caterpillar Tractor Co. "AISI 8622 steel, which we had been using, couldn't give us the hard case and strong, tough core we needed in these heavy sections. Other standard carburizing steels with the requisite properties would have cost substantially more. We found, however, that we could achieve the desired surface and core properties by simply modifying AISI 8622 with a higher percentage of molybdenum. We have been using this composition for several years, and results have been excellent."

Caterpillar Tractor Co.'s experience shows how increasing molybdenum in a carburizing steel helped to solve a specific problem. Perhaps your product, too, can benefit by higher molybdenum content.

A technical article, "New Carburizing Steels for Critical Gearing", describes some recent investigations of higher-moly carburizing steels. For a reprint, write Climax Molybdenum Company, Dept. 2, 500 Fifth Avenue, New York 36, N. Y.

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for industry's



RAPID GROWTH and evolutionary changes in substantially all industrial processes necessitate similar progress in the production of refractories. In order to meet industry's increasing demands and in anticipation of even greater and more exacting future requirements, Harbison-Walker has conducted a continuous program of expansion and modernization. Consistent with this policy, a number of new plants have been built, some of which are here illustrated. Other new plants are under construction at Ludington, Michigan and Hammond, Indiana, the former for the production of dead-burned magnesia of unusually high purity, and the latter for the manufacture of basic brick and other basic refractories. Both will be provided with docks for water shipment. These two new additions provide Harbison-Walker with a total of 36 plants in the United States, Canada, Peru and Mexico. The Company operates scores of mines and quarries located in these areas.

In addition, the production capacities of other plants have been materially increased with the

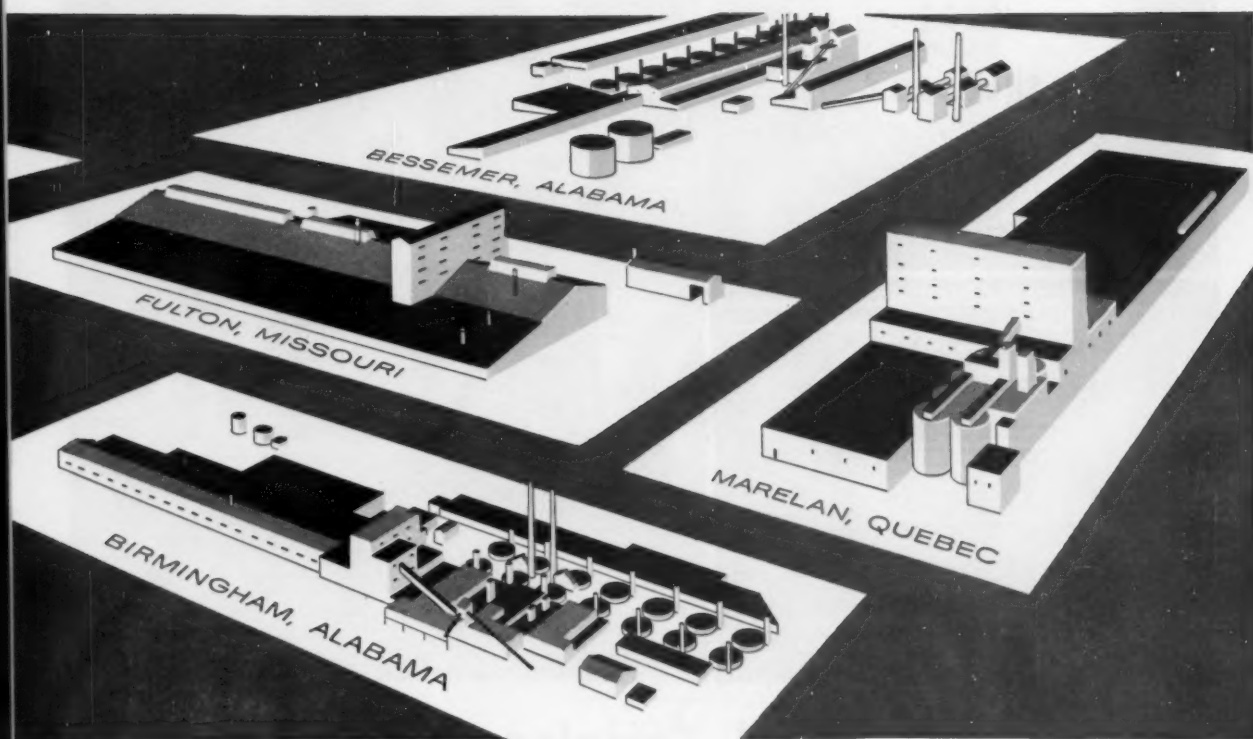
benefit of the most modern facilities. These widely distributed plants are located at Warm Springs, California; Athens, Texas; East Chicago, Indiana; Olive Hill, Kentucky; Portsmouth, Ohio; and Clearfield, Pennsylvania. Further expansion will follow as required.

Coupled with this large expansion is an accelerated research program. A new greatly enlarged central research laboratory will be built in Pittsburgh and the present laboratory then will be converted entirely to Quality Control. Among the main research objectives is the development of new types and classes of refractories needed for new processes and for withstanding more severe service conditions. Another important research accomplishment is the continual enhancement of properties of conventional refractories. Laboratory research is closely co-ordinated with extensive studies of the performance of various refractories in the many kinds of metallurgical and other industrial furnaces.

Harbison-Walker has consistently kept pace with



future refractories needs



industry by the development and adoption of new and improved manufacturing methods. The most modern and precise production processes are used. The present Quality Control Program exceeds anything previously employed in the refractories industry.

These Harbison-Walker progressive accomplishments contribute greatly to better refractory practice for industry. To the producers of iron and steel, aluminum, copper and other non-ferrous metals, cement, glass, chemicals and steam power, better refractories mean longer furnace life, less maintenance and reduced operating costs.

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ALUMINA-SILICA BRICK—Super-duty, high duty and all other classes of fireclay brick.

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SILICA BRICK—Super-duty and conventional.

BASIC BRICK—Metakase, periclase, magnesite, chrome, forsterite, chrome-magnesite and magnesite-chrome.

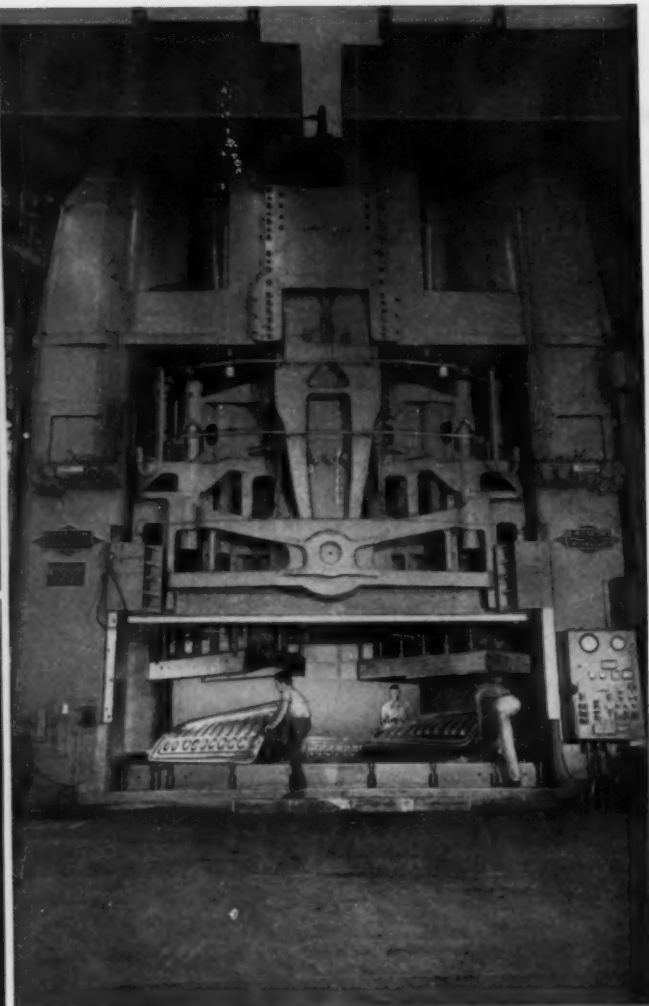
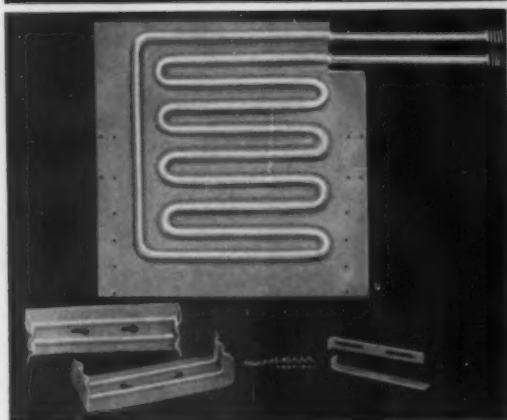


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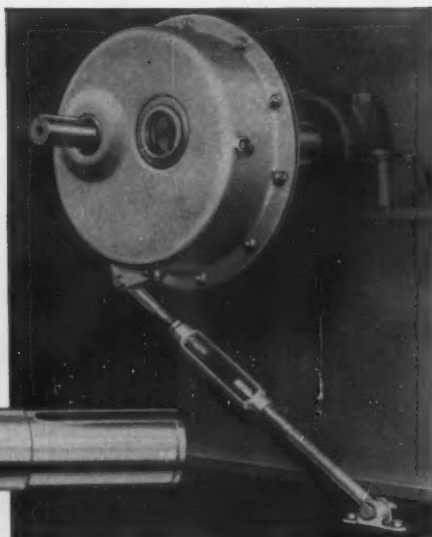
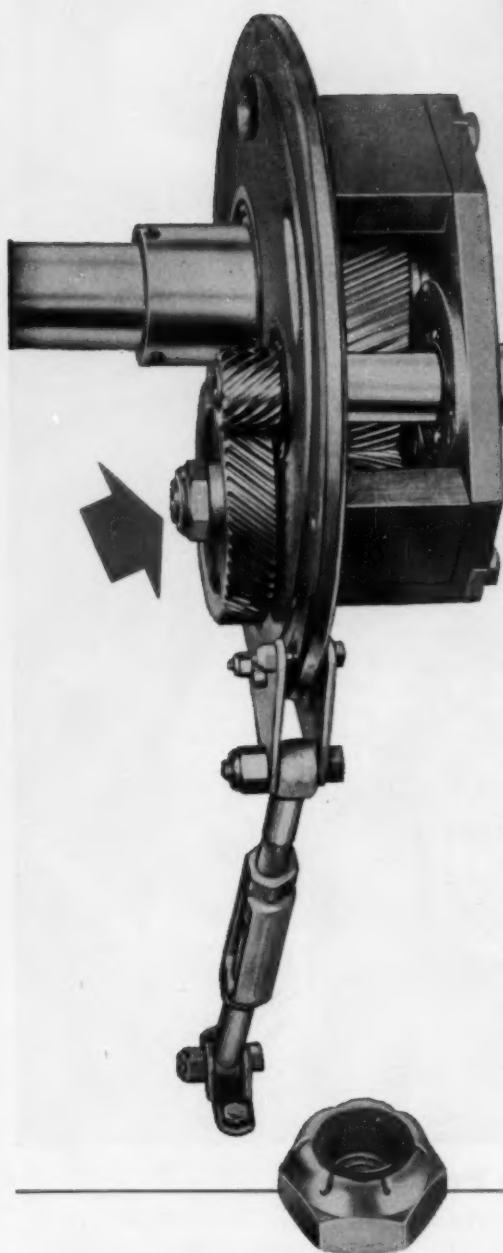
STEEL MILL MACHINERY
HYDRAULIC PRESSES
(Metalworking and Extrusion)
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Weldments "CAST-WELD" Design
ROLLS: Steel, Alloy Iron, Alloy Steel

• . . and the key is Birdsboro's specialized Hydraulic Press design. You can get the steady, high output you need to keep production costs down, yet gain new freedom from maintenance problems. And with Birdsboro's advanced engineering outlook, you are assured of the versatility you may need as diversification and new methods change your production plans. Strike now at rising costs. Call in a Birdsboro representative to look over your present press setup. He may have the answers you've been seeking.

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The Falk Corp., of Milwaukee, also uses Elastic Stop nuts in the tie rod assembly... and on the gear housing to maintain tight cover fit.

Elastic Stop[®] nuts solve critical gear adjustment problem in new speed-reducing unit!

In its rugged new Shaft-Mounted Drive, The Falk Corporation uses a self-locking Elastic Stop nut to secure the high-speed gear to the intermediate shaft, as shown in the illustration on the left.

The precision-made Elastic Stop nut stays firmly in place and the close seat-squareness tolerances maintain the exact original gear adjustment withstanding severe vibration caused by shock loads transmitted through the gears. Costs are cut because drilled bolt holes and cotter pins are eliminated.

Here's how this Elastic Stop nut works: The familiar red collar of the Elastic Stop nut is deliberately undersized in relation to the shaft (or bolt) diameter. It grips the shaft with a perfect fit, enforces a continuing self-locking pressure against the metal threads, and holds the nut securely in place at the desired point on the shaft. This same tight-fitting locking collar also provides a seal that prevents oil from seeping along the bolt threads, wherever oil seepage is a problem. And because the bolt threads are protected against moisture from without, the nuts cannot become "frozen" to the bolt by corrosion. The elastic recovery of the red collar permits extended re-use of Elastic Stop nuts.

Mail the coupon for information on how Elastic Stop nuts can solve your specific fastening problem.

ELASTIC STOP NUT CORPORATION OF AMERICA



Elastic Stop Nut Corporation of America
Dept. N67-977, 2330 Vauxhall Road, Union, N. J.

Please send the following free fastening information:

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can Save You Money**



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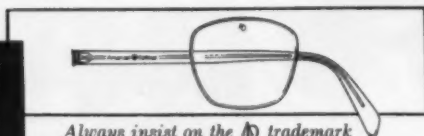
***Here's a Type of Costly Accident He Prevents:**

In a recent case, a machine operator whose eye was permanently injured (loss of vision less than 20 per cent according to medical testimony) was awarded \$2,220 — \$20 per week for 111 weeks. The wearing of eye protection equipment prevents 99 per cent of these accidents according to the Society for the Prevention of Blindness.

The Safety Director also knows well how to protect worker and company against the hazards

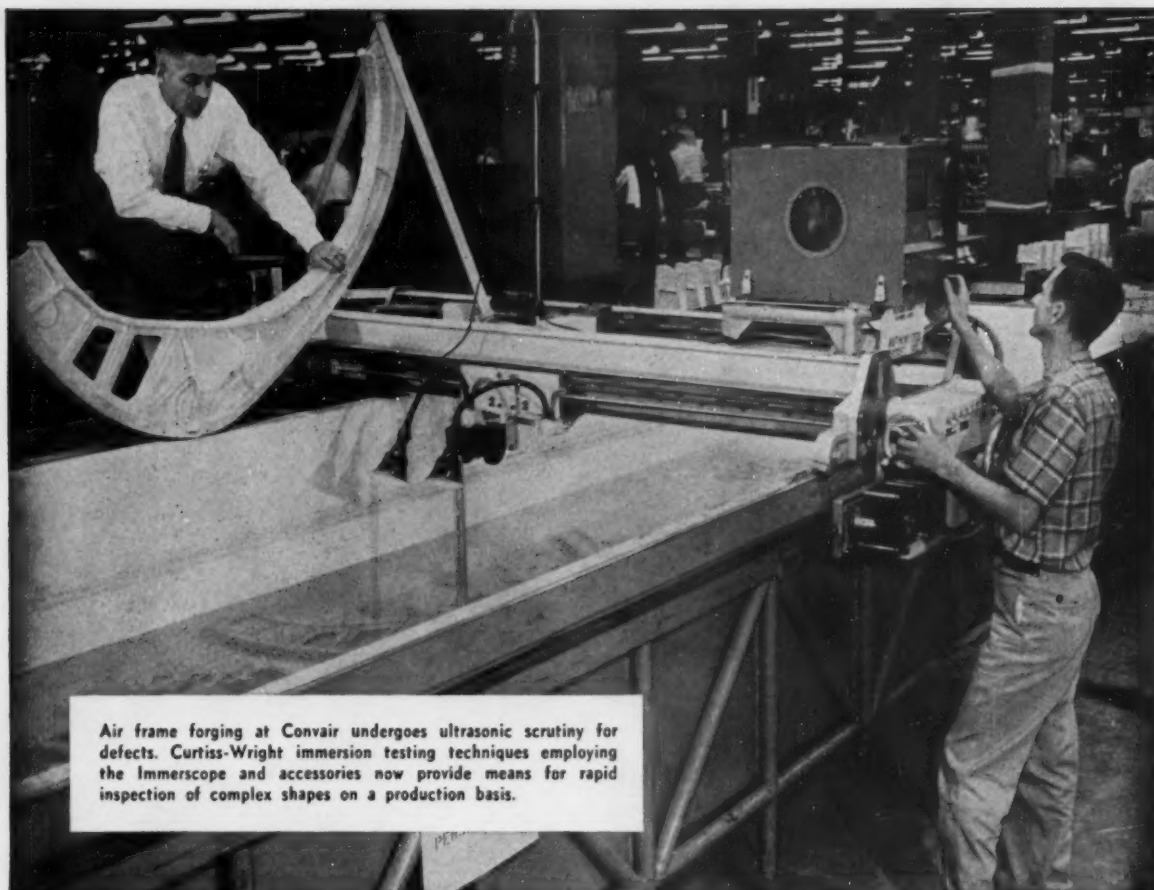
of industrial noise, poisonous dusts and vapors and body and limb injuries. He should, he's a specialist!

As a leading maker of quality safety equipment AO† works closely with safety directors in reducing the costs of industrial accidents. If you are considering an Eye Protection program, for example, call us in for complete facts and figures. The program can pay for itself in less than six months!



Always insist on the AO trademark on safety lenses and frames.

SOUTHBRIDGE, MASSACHUSETTS • BRANCHES IN PRINCIPAL CITIES



Air frame forging at Convair undergoes ultrasonic scrutiny for defects. Curtiss-Wright immersion testing techniques employing the Immerscope and accessories now provide means for rapid inspection of complex shapes on a production basis.

Curtiss-Wright ULTRASONIC IMMERSCOPE Gives CONVAIR Forgings Final Exam for Quality



New Curtiss-Wright Immerscope (Model 424-A) protects quality of forgings, rolled plate, welded tubing, extrusions and other metal products. Complete with controls for gate width and depth, alarm trigger, and sensitivity time control. 400 w, 110-120 v, 60 cycle. 16"x15"x21½". Operates at 2.25, 5, 10, 15 and 25 megacycles.

Metal parts used by the aircraft industry are subjected to quality tests at all stages, from raw material to finished components. To insure *final* quality control at Convair-Fort Worth*, the Curtiss-Wright Ultrasonic Immerscope quickly detects flaws and discontinuities.

This ultrasonic detective "sees" through every square inch of the metal, with electrically induced sound vibrations up to several million cycles per second, revealing flaws as visible "pips" on a cathode ray tube.

The method is sure, fast and low in cost. Curtiss-Wright can engineer and custom-build production testing installations to your exact specifications. Write Industrial and Scientific Products Division, Curtiss-Wright Corporation, P. O. Box 270, Caldwell, N. J.

*Convair-Fort Worth, A Division of General Dynamics Corporation.





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MORE CHIPS per tool
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MORE PROFIT per job . . . than any turret lathe of comparable size!

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is already paying for it

MACHINE TOOL DIV.

B&W Silicon Carbide Refractories for metal-working furnaces

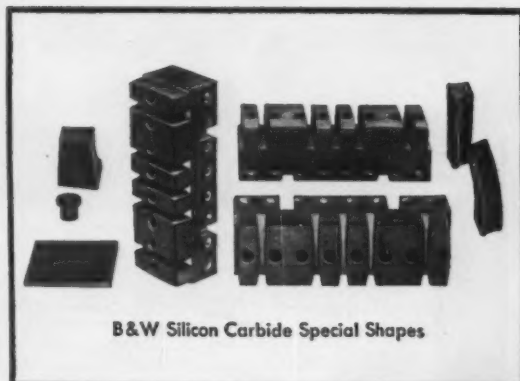
To meet the specialized requirements of the primary metals industry, B&W manufactures Silicon Carbide Refractories in a variety of shapes and sizes. These durable refractories are produced in B&W's Augusta, Ga., works to the same rigid quality control standards used in making all B&W Refractories. See your local B&W Refractories Engineer for further information.



B&W Silicon Carbide Rolls



B&W Silicon Carbide Recuperator Tubes



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THE BABCOCK & WILCOX CO.
REFRATORIES DIVISION
GENERAL OFFICES: 181 EAST 42nd ST., NEW YORK 17, N.Y.
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B&W REFRATORIES PRODUCTS: B&W Allmul Firebrick • B&W 80 Firebrick
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Plastics and Mortars • B&W Silicon Carbide



For improved O-H combustion practice...

Record O₂ Reliably, Heat after Heat

Key to continuous, reliable records of oxygen in open-hearth exhaust gases is the unique L&N sampling system. Self-flushing, self-cleaning, this assembly delivers a thoroughly scrubbed sample of waste gas to the L&N Magnetic Oxygen Analyzer under positive pressure, without mechanical pumps or aspirators . . . and with very little maintenance.

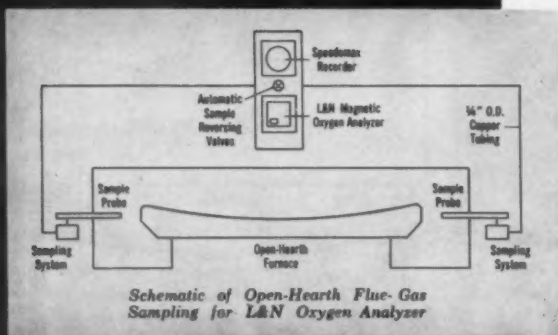
Spray-flushing of the probe opening and internal passages prevents slag buildup and dirt accumulation. The sample gas is drawn from the water-jacketed, stainless steel probe by a steam jet assembly. Expansion of steam accelerates the gas to a high velocity; condensation of the steam scrubs the sample by precipitating all dust and dirt. The cleaned sample travels at 50 ft./sec. in the sampling lines (quarter-inch copper tubing), so that initial response of the entire system is only about 10 seconds.

The Magnetic Oxygen Analyzer and the Speedomax G® recorder, calibrated directly in per cent O₂, may be located wherever convenient . . . are quickly checked against air to assure accurate performance.

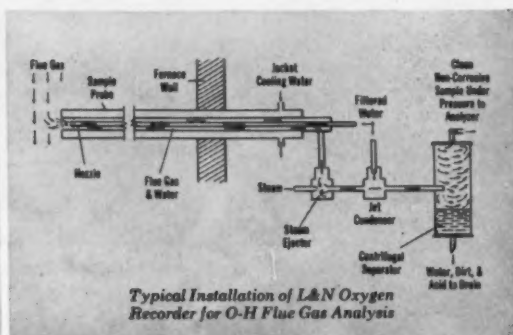
Complete description of this equipment is contained in Process Data Sheet 643 (5), available from your nearest L&N representative. Or write us at 4956 Stenton Avenue, Philadelphia 44, Pa.



In this O-H shop of Jones & Laughlin Steel Corp., Pittsburgh, the L&N O₂ Analyzer is used with a Speedomax G Controller, which adjusts a fuel-air controller (not shown) to provide automatic combustion control.



Schematic of Open-Hearth Flue-Gas Sampling for L&N Oxygen Analyzer



Typical Installation of L&N Oxygen Recorder for O-H Flue Gas Analysis

HOW USS "T-1" STEEL IMPROVES THESE PRODUCTS...

... Lops Off 1,047 Lbs.

Trays for ore clean-up buckets need tremendous resistance to impact, abuse, and abrasion. Blaw-Knox Company, Pittsburgh, Pa., found that they weigh half a ton less, and cost less to fabricate when made from USS "T-1" Steel plate instead of heavy steel castings.



Three Ways Better...

International Nickel Company of Canada expects USS "T-1" Steel to increase the service life, to reduce the maintenance, and lower the long-term cost of ore cars like this one; because "T-1" Steel has far greater strength, toughness, and resistance to abrasion than steel used previously. The car builder, Canadian Car and Foundry Co., Ltd., has had no difficulty fabricating this very strong alloy steel.



... 534 Easier Welds

This printing press bedplate manufactured by Graver Tank & Manufacturing Co., Inc., must be welded in 534 places. High alloy steel with the needed strength was very difficult to weld. But USS "T-1" Steel is easy to weld... and has the needed strength to keep these bedplates, used on high-speed printing presses, as lightweight as possible.

HOW USS "T-1" STEEL CAN HELP YOU

The great strength and toughness of USS "T-1" Steel (90,000 psi, minimum yield strength) helps you to increase the capacity and durability of power-shovel buckets and storage tanks without increasing weight.

Its excellent weldability enables you to fabricate large equipment out in the field without heat treatment. It thus reduces fabricating and shipping costs and speeds up construction.

Its unusual toughness at sub-zero

temperatures improves service life of equipment that must take impact, abrasion, and abuse in all weather.

USS "T-1" Steel also gives you good creep-rupture strength to 900°F. It often can be substituted for more expensive steels that are more difficult to fabricate. There is a place for "T-1" Steel somewhere in your designs. Write, wire, or phone for complete information. United States Steel, Room 5533, Pittsburgh 30, Pa.

UNITED STATES STEEL CORPORATION, PITTSBURGH • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.

UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST • UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS **"T-1"** CONSTRUCTIONAL ALLOY STEEL

See The United States Steel Hour. It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.



UNITED STATES STEEL

F A C T S

about

NEW DEPARTURE BALL BEARINGS

Self-sealed bearings simplify design... cut maintenance costs

New Departure originated self-sealed ball bearings to eliminate the most common causes of bearing wear and failure—such as abrasive dirt and improper lubrication. Since then, more than 300,000,000 New Departure sealed bearings have been produced in various types to fit the specific requirements of industry. Seals are available to keep out foreign matter, ranging from dust and dirt to corrosive gases . . . to retain lubricants, varying from heavy grease to light oil . . . to provide the protection that assures longest life.

New Departure's latest advance, Senti-Seal, embodies exclusive features which importantly improve both bearing performance and range of application. Because of its design, Senti-Seal provides controlled, highly efficient sealing with low torque and is not materially influenced by axial movement due to bearing end play within prescribed tolerances.



Sealed ball bearings offer the electric motor and machine tool builder many advantages. They simplify design, make it possible to mount motors in any position, cut maintenance to a minimum, and eliminate the need for relubrication for long periods of operation.

WRITE FOR COMPLETE INFORMATION ON
NEW DEPARTURE SEALED BEARINGS!

NEW DEPARTURE • DIVISION OF GENERAL MOTORS CORPORATION • BRISTOL, CONN.

NEWSFRONT

Steel Shortages: Hitting Hard

The steel shortage has plate, structural users digging deeper and deeper—one fabricator reports paying out nearly \$100,000 a month in premiums for scarce items. Extra costs include abnormal warehouse, freight and conversion payments. The company isn't happy, but faces alternatives of either shelling out with reasonably good grace or cutting back production.

Who's For CO₂ Core Hardening?

Small foundries attempting to increase output without additional capital investment are flocking to the CO₂ process for core-hardening. About 500 foundries use the process compared with 50 or so a year ago. Not yet profitable for high production runs, the process permits boosting output of cores without extra drying ovens. Best missionaries: materials salesmen.

Michigan May Be Next Ore Source

Success story on utilization of Minnesota's low-grade taconite iron ores could have a sequel in Michigan. Upper Peninsula iron ranges have huge reserves of iron-bearing jasper. Formations known to exist within 100 ft of the surface contain more than 25 pct iron. If vigorous efforts to beneficiate the material succeed, an estimated 750 million tons of rich concentrate could be gained—without expense of underground mining.

M-1 Rifle: In or Out?

Watch for the Army to reveal within the next week or two whether it will officially adopt either of two new lightweight rifles. Extensive tests have been given the Belgian FN and the Army-designed T-44, but objections have been raised to both. Chances are fair the Army will pass up both in favor of existing M-1, modified to take a half-inch shorter cartridge.

Fire Losses Are Up Again

National Fire Protection Association feels metalworking plants may be slackening their

fire protection efforts dangerously. Fire rates have been climbing recently, figures show, with metalworking in particular registering a marked increase. Heightened business activity, group feels, is not the whole explanation.

Louisiana Gets New Alumina Plant

New Olin Revere alumina plant will be built on a 4100 acre plot at Burnside, La. Land deal was closed last week for Olin by F. H. McGraw Co., construction firm acting as its agent.

Educational Aid Pays Returns

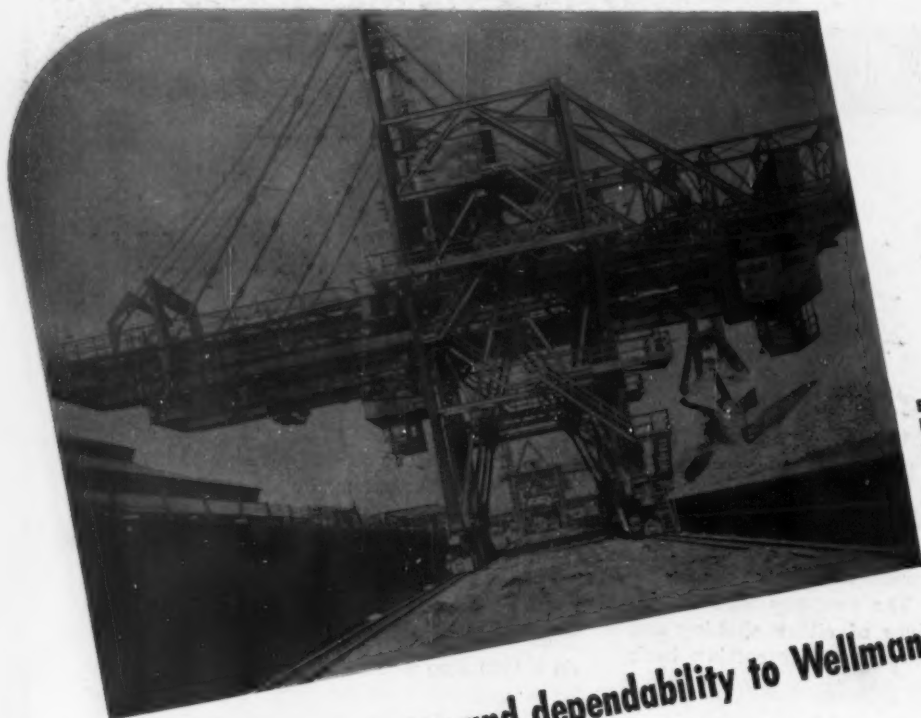
Federal aid to scientific and engineering students is paying off in improving skilled help on U. S. contract projects. More than one-third of students getting government aid for graduate study in sciences have been working as assistants on federal research grants or contracts. New assistance programs have opened since 1954, when some 101,000 persons were receiving such help toward science careers.

Federal Nickel-Buying to Hold Up

ODM denies any plan for sharply dropping nickel stockpile purchasing next year. Diversions from the stockpile in last two years (74.3 million lb in '56) have put nickel hoard behind, and ODM is trying to push more nickel expansion by offering premium prices. Also, individually negotiated, sometimes long-term contracts will prevent any sharp dips in buying for years, they claim.

The Radioactivity Lingers On

Recent information on a five-year-old explosion points up problems of handling radioactive substances. A tiny platinum capsule of radium exploded in 1951 at a midwestern electronics plant. Despite immediate washdown measures, workmen tracked radium dust all through the building. Result: the entire establishment remains untenable. A \$200,000 insurance settlement is pending.



Eighteen compact Cleveland Speed Reducers enable operators of these Wellman ore unloaders to quickly and accurately position the grab buckets over the proper hatch of the freighter alongside the dock.

18 CLEVELANDS give accuracy and dependability to Wellman ore unloaders

FOR 37 years, smooth dependable power transmission has been supplied by Cleveland Worm Gear Drives.

On this pair of massive 10-ton iron ore unloaders, 18 Cleveland drives provide a steady, uninterrupted flow of power to the trolleys and driving trucks. So rugged are the trouble-free Cleveland drives that danger of sudden failure is remote—even if briefly overloaded two to three times their rated capacity.

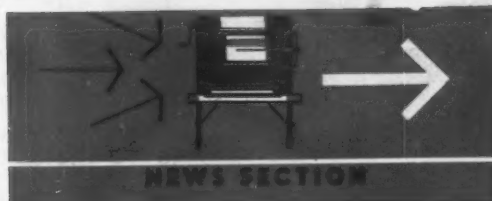
These Wellman "Work Horses" must be on the job around the clock to quickly unload ore carriers so they can return to the Iron Ranges for another load during the all-too-short Great Lakes shipping season.

Why not let us present the complete story on how Cleveland drives can dependably and economically handle your power transmission problems? Write today for Catalog 400—it's free. The Cleveland Worm and Gear Company, 3282 East 80th Street, Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers, Limited.

CLEVELAND
Worm Gear
Drives





STEEL: It's An Expanding Business

Industry will increase capacity 15 million tons by 1958 . . . Costs are major problem in creating new production facilities . . . Emphasis is on modernization, improvement in new capacity—By R. D. Raddant.

♦ STEEL IS WELL into a round of expansion that will add more than 15 million tons to the nation's steelmaking capacity by the end of 1958 or early 1959.

The industry is firmly committed to spending more than \$2 billion on this mammoth program of growth. And it will be reflected in more than mere statistics of ingot capacity.

The program will round out and improve finishing facilities to take the best advantage of ingot production. It will improve quality of many products at many mills, provide a wider range of finished products in most companies. Output of traditionally tight products will be vastly increased.

Emphasis on Improvement

It is characteristic of the current programs that, despite the 15 million more tons of steel capacity that will be created, much of the increase will be through improvement and modernization of existing facilities.

In the entire program, only a comparative handful of entirely new openhearth furnaces is contemplated, while increased capacity will come largely through less expensive, but equally effective, modernization programs.

Only two or three entirely new blast furnaces are planned, although a number will be remodeled. At the same time, oxygen converter units are in the works at a number of companies and many new sintering units are planned to aid pig iron production.

The entire program reflects the nearly prohibitive cost of build-

ing new steel capacity from the ground up, places the emphasis, and pressure, on creating most possible capacity at lowest possible cost.

This is one good reason why the Association of Iron & Steel Engineers expect a record attendance at its annual convention next week. (Cleveland Public Auditorium, Sept. 25-28.) It will probably be coupled with record interest in the latest equipment and process developments that will be scanned by the engineers who are responsible for creating the 15 million tons of capacity and related facilities—and for actual spending of most of the \$2 billion.

In addition to the 15 million tons

and \$2 billion of additional steel capacity that is definitely under way, steel companies have requested rapid tax amortization aid from the Defense Mobilization Board for \$1 billion additional expansion. More requests will undoubtedly follow if the outlook appears more favorable.

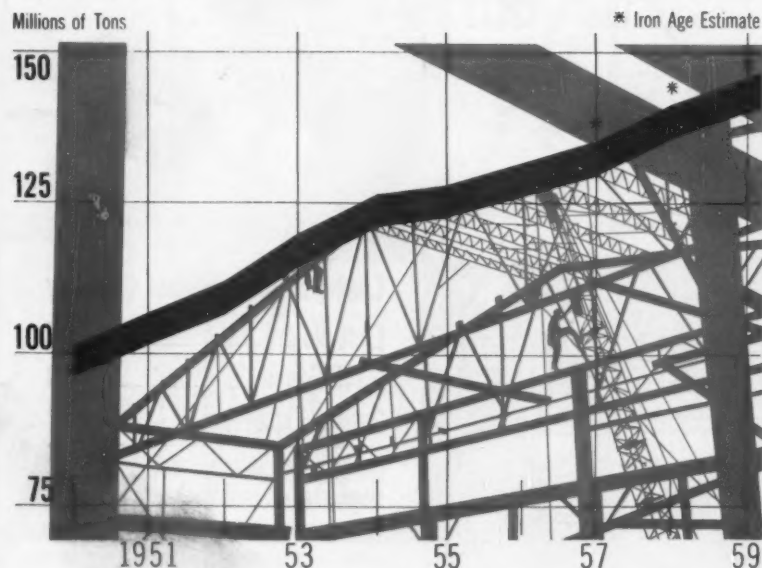
Another Look

Re-examination of steel capacity goals for possible fast tax aid stems from these factors: mounting defense needs, currently emphasized by the Suez crisis; tightness of steel products, particularly those needed for defense or oil country, also emphasized by the Suez; and mounting cost of new steel capacity.

Meanwhile, steel's own construc-

Steel Expands To Meet Nation's Needs

(capacities, Jan. 1)



SPECIAL REPORT

tion plans have been slowed by the steel strike and resulting tightness of steel products. Like construction projects everywhere, building programs have been set back by shortage of structurals and other products. Some projects, scheduled for completion in 1957 will not be completed until well into 1958.

Here is the summary, company by company, of current expansion plans of the 15 largest steelmakers:

U. S. Steel Corp.—Expansion will result in an increase in capacity of nearly 4.5 million tons in the next two to three years. Comparable enlargement and improvement in finishing and related facilities is also planned.

Gary Works' capacity will be increased by 700,000 tons through improvements in openhearth to a total capacity of 8 million tons.

South Works will gain 500,000 tons to a total of 6 million through improvements in openhearth facilities.

Columbia - Geneva Div. will increase ingot capacity at Geneva, Utah, by 380,000 tons.

In addition, capacity in other U. S. Steel plants will be increased a total of 2.5 million additional tons.

Bethlehem Steel Corp.—Plans call for an increase of 3 million tons of ingot capacity in a \$300 million program.

Sparrows Point is scheduled to be increased 2 million tons, bringing the works' capacity to about 8.2 million tons, passing U. S. Steel's Gary Works to become world's largest.

Lackawanna and Bethlehem will each have 500,000 tons of increased capacity through improvements and enlargements of openhearth.

Republic Steel Corp.—Expansion program will increase the company's capacity by 1,776,000 tons at a cost of \$152 million.

Fast Write-off:

■ Of vast importance to steel's immediate expansion plans is the decision of the Office of Defense Mobilization on fast tax amortization.

■ Total new applications now on file cover \$1 billion for steelmaking facilities, ranging in scope from finishing capacity to ore development. Only part of the requested fast tax aid is for announced capacity, but much is for capacity that would not be constructed in the near future without tax aid.

Jones & Laughlin Steel Corp.—\$115 million will be spent in 1956 alone on a program that will increase ingot capacity 700,000 tons.

Some major projects under construction or to be completed this year include: A continuous hot slab scarfer and new oxygen generating facilities at Pittsburgh; increased tin plate production, new bar mill facilities, new oil country goods facilities, increased wire production, two oxygen blown converters (300,000 tons capacity); a 44-in. hot strip mill, additional soaking pits, two contin-



**Cost of
50-hp Mill-Type Motor**
1956—\$3577

1946—\$1330



Cost per Ton of Steel Capacity

| | |
|------------------|-------|
| Last Round | \$ 85 |
| Next Round | \$200 |
| Future Expansion | \$350 |

(Including all facilities and raw materials reserves.)

Steel Capacity

(In Millions of Tons) 1956—128.4

1946—92.0

Property Investment

(In Billions of Dollars) 1956—12.0

1946—5.7

C. M. White, Chairman, Republic Steel

Will ODM Reopen Steel Goals?

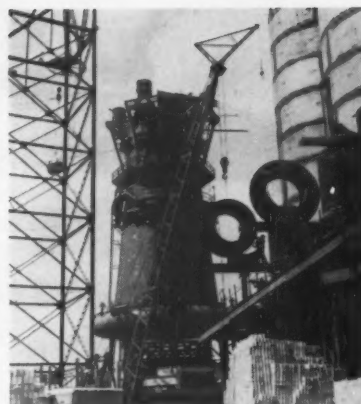
■ Goals for steel expansion previously had been closed. But in recent weeks a request from Jones & Laughlin for tax aid for a \$250 million mill to produce oil and gas pipe in Texas revived the issue.

■ The Defense Mobilization Board this week receives Mobilizer Arthur S. Flemming's report on expansion goals. Prior to the issuing of the report, Washington authorities predicted Mr. Flemming would recommend a reopening of expansion goals

for a number of industries, including basic steelmaking.

■ Basis for this belief was a recent study of present and future mobilization needs compiled by the Business and Defense Services Administration. This was believed to indicate that the nation's present steelmaking capacity is short of what will be needed to support military and civilian requirements for another emergency.

■ A final decision by the DMB will not be reached until late in year.



Picture credits: Republic Steel, Pittsburgh Steel, Allegheny Ludlum, Armco.

uous weld pipe mills and other facilities at Aliquippa.

At Cleveland a large ore sinter line, improvements in openhearth capacity, electric furnaces which, with openhearth, will increase capacity by 400,000 tons.

National Steel Corp.—1 million tons of increased capacity will be added, divided between Weirton Steel and Great Lakes Steel, National's steelmaking divisions. A total of \$200 million will be spent for the new capacity and improvement and enlargement of related facilities.

Youngstown Sheet & Tube Co.—A two-year program costing \$250 million to increase capacity 1 million tons is under way. About \$90 million will be spent in 1956. Increased capacity will be reflected in output of both Youngstown and Indiana Harbor facilities. A new tin mill and seamless tube mill are under construction at Indiana Harbor.

Inland Steel Co.—The current three-year, \$260 million expansion program will result in \$75 million in expenditures this year. The program will increase capacity 15 pct to 6 million tons by 1959. Included is a new slabbing mill, second cold-rolled sheet department, increased capacity of hot strip mills, a continuous normalizing line for enameling sheets, and other equipment. Plans include a Chicago Loop office building.

Armco Steel Corp.—A \$111 million expansion program includes three new openhearth at Middletown. Capacity of the company will reach 6.2 million tons by early 1958. One furnace was put into production in January. The other two are under construction.

Colorado Fuel & Iron Corp.—Final \$10 million of a \$23 million expansion program was spent this year. Buffalo capacity was increased 120,000 tons, Pueblo, 200,000 tons and Buffalo blast furnace improved. Other finishing capacity was modernized or added.

Wheeling Steel Corp.—A \$65 million improvement program of its Ohio valley plants is partially completed. A net increase in ingot capacity is contemplated through improved or supplemented openhearth capacity and replacement of Bessemer converters.

Kaiser Steel Corp.—A \$113 million expansion of the Fontana mill will increase production of finished products 40 pct from 1,084,000 tons annually to 1,528,000. Projects include an oxygen process steelmaking unit, slabbing mill, increased hot strip, plate and tinplate mills.

Sharon Steel Corp.—A \$6 million electric furnace shop at Farrell, Pa., is most recent expansion announcement. The company is erecting a 44-in. blooming mill, adding 350,000 tons of openhearth capacity by enlargement of three

openhearth. The electric furnace shop will double present capacity of the company to produce stainless and high alloy steel.

Pittsburgh Steel Corp.—Current plans involve a \$15 million modernization program to give 14 pct expansion of ingot capacity or 180,000 additional tons. A \$6 million billet mill will be installed at Monessen to round out production facilities.

Granite City Steel Co.—Expansion will increase steelmaking capacity 504,000 tons to 1,584,000 total by the end of 1958. Plans also include improvement and additions to production and finishing equipment so new finishing facilities will be in line with new capacity. This will enable the company to produce wider hot-rolled sheets and plates and to increase production of cold-mill products. A new blast furnace was blown in in July. Improvements include; openhearth modernization and enlargement, new soaking pits, 77-in. hot strip coiler, and other related processing and finishing facilities.

Detroit Steel Co.—Plans for 1956-57 include a 300-ton openhearth, additional coiler, automatic scarfer, additional annealing furnaces for cold mill, four additional soaking pits, and a welded wire fabric machine. Expenditures this year are expected to be \$10 million.

SHIPBUILDING: More Champagne Needed

With 41 merchant ships under construction or planned, outlook for the shipmakers is improving . . . Tanker building, Conversion of present vessels is big factor . . . Steel supply pinch could hurt—By G. G. Carr.

♦ AMERICAN shipbuilders are scudding along happily under freshening trade winds. Barring sudden squalls, they see clear sailing with even brisker business breezes for some time to come.

Immediate cause for the cheerful log is 41 merchant ships of 670,060 gross tons now under construction or contract in U. S. yards as of Sept. 1, figures of Shipbuilders' Council of America reveal. This is a substantial increase over the 16 ships of 240,700 gross tonnage on builders' books 1 year ago.

Current business should keep shipyards busy for some time to come. Of the 41 ships now building or on order, 21 are less than 10 pct completed, and only 9 are more than 50 pct finished. Four of the 41 have been launched, 14 are on building ways, and 23 keels are still to be laid. Present delivery schedules call for 6 ships to be completed this year, 20 in 1957.

Bulk of present business is in tankers. Twenty-nine of the 41 ships are in this category, followed by 4 passenger-cargo ships, 3 cargo ships, 2 ore carriers and 1 each—cargo ship (dock), Roll-on Roll-off cargo ship and passenger-auto ferry. Tanker owning and operating has become international big business, is now attracting financial backing from such gilt-edge firms as New York's Dillon, Reed Co.

Additional cargo for yard order books comes from conversion programs. Maritime Administration is currently experimenting with upgrading at least four Liberty-class ships. Three of these are being lengthened, and all four are receiving new turbine-type power plants. And private sources are converting Mariner-class cargo ships to passenger carriers. Passenger trade is now paying handsome profits for the first time in decades. With many travelers will-

ing to exchange luxury for low-cost water transportation, ship-owners see conversion as a good way to get some of the gravy. And the recent Andrea Doria disaster has reminded many that American ships are built and operated by the highest safety standards in the world.

Conversion's Good Bet

Builders are hopeful that conversion is charting the course to future smooth sailing. The forecast is bright. A large part of our merchant fleet is obsolescent. Majority of the ships were built during World War II, are now too small and too slow for today's shipping requirements. If conversion experiments prove out (naval architecture is part science, part art), this work would be important business for some time to come.

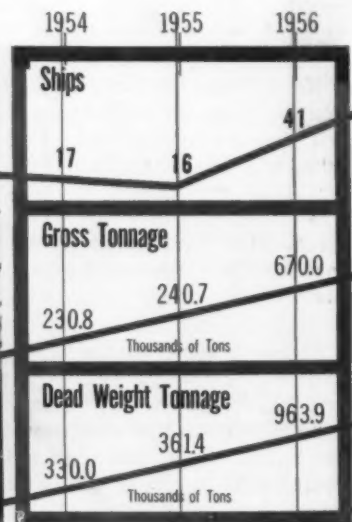
New orders should come from other sources as well. A 3-year Navy program involving sizable tonnages for private yards is now in the works, with no sizable snags expected. Roll-on, Roll-off ships for combined truck and water movement are proving a significant innovation, with orders for these special craft almost certain to grow. Another new wrinkle is refrigerated tankers. These are proving profitable for such specialized applications as citrus fruit juices.

Boom Is Worldwide

The current worldwide shipbuilding boom is another hopeful, although less immediate, omen for U. S. yards. Foreign yards are booked full and this should mean spill-over business for domestic builders if the present pace continues. The "if" is important, for American yards cannot normally

New Life For U. S. Shipyards

(On order or under construction)



compete in world markets due to high operating costs. Ordinarily, they must depend on federal shipbuilding subsidies if they are to book any but maintenance work. Now, however, they are hopeful that shipowners will be forced to buy American in order to get delivery on new bottoms.

Bigger, More Expensive

Shipbuilding isn't getting any cheaper. In addition to higher prices for such goods and services as steel and labor, ships, especially tankers, are getting bigger. Modern ship operation requires larger and larger payloads (plus faster turnaround) for profits. In the tanker field, some operators find it pays to discharge into lighters when jumbo ships won't fit into harbors. Larger cargoes compensate for the cost of extra handling. But bigger ships of course are more expensive ships.

Current cloud on the horizon is the tight steel market. THE IRON AGE Continuing Study, "Steel Distribution by Consuming Industries" shows that last year shipbuilding accounted for about 667,000 tons of finished steel shipments. (In the peak year of 1944, the figure was over 12,000,000 tons or about 20 pct of all steel shipped.) Much of this is in hardest-to-find plate and structurals. Some East Coast yards have been reported turning down routine repair jobs, urging ship owners to postpone all but emergency maintenance until the steel market eases. While no major new ship orders have been refused for lack of steel, some smaller yards have turned down harbor craft business for lack of metal.

Present shipbuilding business is concentrated on the East Coast, with yards there holding 30 of the 41 new ship orders. Gulf Coast yards presently account for 9 ships and West Coast and Great Lakes 1 each. Lakes building in particular is expected to rise as both increased Canadian ore movement and Seaway development make themselves felt. And the proposed Navy program should help West Coast yards. All in all, American shipbuilders see clear weather ahead. Champagne bottles will be swung more often.

DISTRIBUTION

STEEL: Congress Probes Sales

Producers are asked to produce percentage figures of shipments to affiliates . . . Complaints charge steel companies shut out independents in tight market—By N. R. Regeimbal.

◆ SENATE Small Business Committee is asking 15 major integrated steel producers what percentage of their output has gone to affiliated fabricators and warehouses, how much to independents.

It's possible that the questioning, which is the result of complaints that small operators are being "frozen out" in the tight steel market, may open a full-dress public probe of steel distribution.

The committee asserts that it is aware that the current complaints are the type which often develop in periods of tight supply, but says the quality and heat of some of the complaints led to the current study.

Heated Charges

Some allege actual freeze outs by the integrated producers. Most charge they aren't getting steel on an equitable basis with competitors who are part of integrated operations.

Several independents have told the committee they were low bidder on jobs, but when they seek steel to fill contracts, they are told there isn't any available. Then a fabricating subsidiary or division of an integrated producer comes up with the steel to get the job.

Most of the complaints center around broken delivery promises and refusals to sell structurals, heavy plate and tubular goods—all items in very short supply.

The committee led off its investigation by talking formally to some 40 West Coast independents, and dozens of others in the same area informally, plus more than 100 independents from other sections of the country.

The committee has been asked

repeatedly by the independents for help in finding out just exactly what—if any—allocation system various mills use. The same mill, they charge, gives different answers to different customers.

Who Got What?

By the end of September, the committee expects to have the answers to questionnaires it mailed to the 15 large producers. They ask for figures on the tonnage of steel shipped to fabricating subsidiaries and affiliated warehouses as a percentage of total production, to determine how much was made available to independent operators. Request covers years 1949 through 1955.

Meanwhile, the Senate-House Economic Committee, which has been threatening to lead off a planned probe of industrial wages and prices by putting its spotlight on the steel industry, won't make a final decision until late in October. The staff of the group has collected bushels of material, but Sen. Paul H. Douglas, Illinois Democrat, is on the campaign circuit and hasn't made up his mind whether to go ahead with the hearings, a committee source says.

Possible Actions

When the tabulation of steel shipments is completed and correlated, the committee will decide whether to turn the investigation into a full scale probe.

While some extreme measures, such as requiring integrated mills, by use of antitrust laws, to divest themselves from fabricating subsidiaries, have been suggested by complaining companies, the committee indicates it isn't interested in these possibilities now.

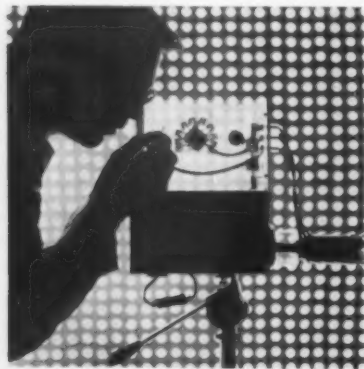
LABS: Back To The Basics

Westinghouse dedicates new laboratory . . . Will stress fundamentals . . . New concepts with no particular commercial application . . . Show impressive array of products.

♦ **WESTINGHOUSE Electric Corp.** is bearing down on research and development to the tune of \$150 million per year, more than 10 pct of its total billings, seven times as much as the outlay for advertising and sales promotion.

A large portion of this is applied research, handled by 200 centers throughout the country. Nevertheless the emphasis is more and more being placed on the fundamentals. The new laboratory recently dedicated in Pittsburgh will feature projects of which about 30 pct will be basic, with no commercial application in mind. And 60 pct of the investigations will be made in uncharted regions, but directed along lines that are likely to yield useful commercial information.

There's good reason for all this



SILHOUETTED against test pattern is Ebicon, 100 times more sensitive TV tube developed by Westinghouse.

activity and expenditure of time and energy. Head of Westinghouse research and engineering, Dr. J. A. Hutcheson predicts that electrical consumption will double within the next decade. Radio Corp. of America reports that 85 pct of its revenue comes from products and services that didn't exist ten years

ago. Dr. Hutcheson agrees with this, and goes even further. He believes this pace will be stepped up in the coming decade. Another



BLOWING bubbles is done because the soap bubbles react in much the same way as atomic crystal structures.

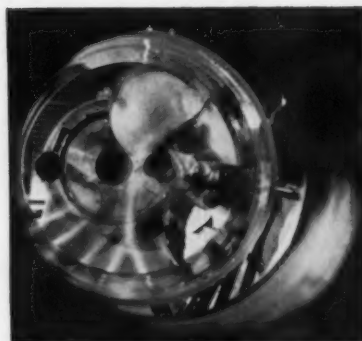
prediction: a one million kw turbo generator will be built within 10 years.

What's New

All of this hectic expansion activity is crowding the limits of today's material. Dr. Hutcheson believes that new concepts will be needed.

Commenting on this intense interest in theoretical research, one Westinghouse research man was a little puzzled. He wasn't sure why his own and other companies had become so enthusiastic about broad inquiry. At the same time he said he was happily working nights and weekends, and had come up with at least one new concept that had proved highly useful commercially.

It nevertheless seems to be obvious that broad research pays off. At its new laboratory dedication Westinghouse unveiled an impressive array of new products includ-

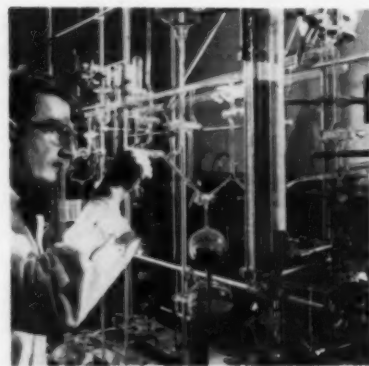


ing a new insulating material, a high temperature alloy made up of clad molybdenum, a new gyroscope and a new light amplifier.

Industry Wide

Despite the new concepts involved many of these are in advance stages of development.

The Westinghouse Laboratory is really only the latest and gaudiest of a number of industry projects along these lines. Armco Steel Corp. is sinking \$300,000 into expanding its stainless steel lab at Baltimore. Rem-Cru Titanium Inc. has purchased 262 acres for



COMPLEX apparatus is commonplace in experiments at new Westinghouse lab. Above—a technician tools edge of a glass ring, which will be fused with another for electronic studies.

possible construction of a new research laboratory. Koppers Co. has also purchased land, reports its research program will be tripled in the next 10 years.

Programs like this are responsible for the fact that industrial research has doubled every five years since 1940. There are now 300,000 researchers in U. S. industry accounting for yearly expenditures of about \$4 billion.

OILFIELD EQUIPMENT: Rigs To Riches

Offshore drilling and secondary recovery operations are shaping trends in oilfield machinery and tools . . . Since 1954 it's been a buyers market, but industry growth is marked . . . Competition healthy.

♦ **SITTING** on a strong but volatile market, makers of oilfield machinery and tools look for another banner year.

First half figures indicate a 25 pct jump in 1956 shipments of drilling rigs, sucker rods and other devices for tapping oil supplies. Value of shipments by the end of the year will probably reach \$750 million and could easily go over the billion mark.

Backing this prosperity is the climbing demand for oil. Domestic demand is averaging 8.9 million bbl a day; should hit 10 million bbl next year. To meet this need, oil men will drill about 58,000 wells this year, or 13,500 more than in 1951 and probably 20,000 less than in 1965.

Equipment Reusable

More than 400 companies are supplying the equipment needed for this activity, compared to 345 in 1945 and 230 in 1947. Among the largest are the oilfield supply divisions of major steel mills.

Whenever a new well is drilled, new casing and tubing must be ordered. Once used, these products are rarely, if ever, recovered. It is a big factor in the shortage now being experienced in oilfields goods.

But the situation in oil country equipment is different. Most equipment items can be reused. The demand for these items is less rigidly pegged to oilfield activity. Equipment sales rose less than 1 pct in 1954 despite a 10 pct jump in well drilling.

Offshore drilling is calling for equipment designed to operate on platforms 100 ft above the sea floor.

The trend toward deeper drilling has played a part in the swing toward rotary equipment and

away from cable tool drill units.

Average well depth (about 4000 ft) has increased only 500 ft since 1947 and actually declined a few feet last year. But more important than depth is drilling speed. The high cost of drilling, the need to get at oil before leases expire and the competition with nearby wells have all brought a demand for high speed drilling equipment.

Problems of the equipment maker are many. The current shortage of tubular products will cut into his market by reducing the number of wells drilled this year by 1000.

Equipment makers increased their use of nickel bearing stainless by 200 pct in 1955: they could

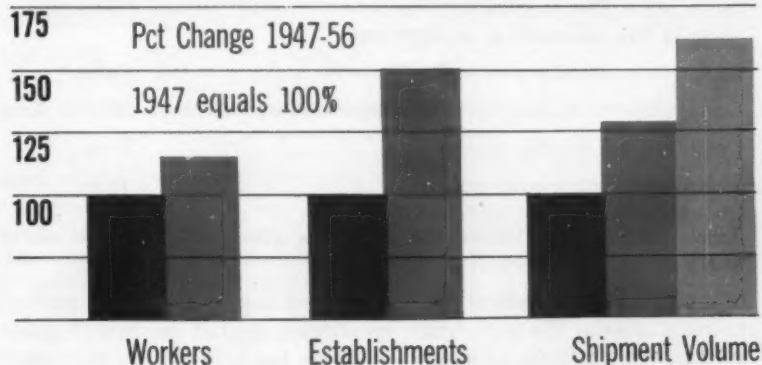
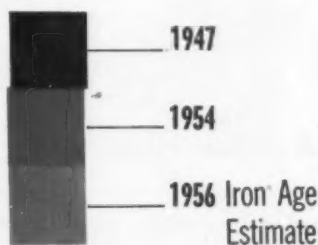
well be hit by the nickel pinch.

But the biggest problem is gagging the twists of a special market. When the rest of the economy slumped in 1954, oil field activity spurred.

Equipment makers must stay on top of other market quirks. At the end of 1955, there were a record 3300 drilling rigs in operation. Today, there are about 2700 rigs working. This means there are over 500 rigs stacked up; 500 more wells could be drilled without anyone buying a new rig.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., THE IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

Banner Year In Oil Fields



Source: 1954 Census of Manufacturers

Shipments based on '47 dollars

MERIT RATING: A Positive Plan Pays Off

Years of experimenting by a machine tool manufacturer turns up an almost trouble-free wage and salary system . . . Accent placed on employee development . . . Inequities are corrected by remedial approach.

♦ THE BOSS who talks up an employee's good points yet makes him conscious of his weak ones—without making an issue of them—is likely to get the best performance out of his workers.

This little rule of tact is the basis of a new idea in employee merit rating that has been worked out successfully by Wiedemann Machine Co. of Philadelphia. The company calls it an "employee development" program.

Inequities in wage differentials and job classifications carried over from war years had plagued Wiedemann—as they have many another company—since 1946.

Supervisors Judge

After trying several types of merit rating systems, none of which worked out, the company called in Michael A. Barone, a wage and salary consultant, and set to task devising an original system.

Basically, the technique they came up with involves rating employees in the areas of personality, education, social knowhow, job performance and supervisory ability. Heavy reliance is placed on the supervisor's judgment, but the system makes allowances for strict and lenient supervisors.

Mr. Barone and Wiedemann management labored for months selecting the factors which they thought most suitable to the several departments; sales, engineering, clerical and administrative, production and foremen. All of the company's office employees are subject to rating.

Since the program was inaugurated six months ago, 26 employees have been upgraded, but the rate is expected to maintain 3 pct of the payroll dollar.

Theodore A. Wiedemann, vice president, operations, is enthusiastic over the new "employee development" concept because it gives

the company a chance to take full advantage of its "pool of human potential" without sacrificing morale.

"We've tried many systems and we know this one is bound to result in better labor-management relations," he says. Not that Wiedemann's labor dealings have been bad. Turnover in personnel is negligible.

"Complete fairness is always difficult. We are attempting to minimize human error with as objective an evaluation plan as possible," Mr. Wiedemann explains.

"Our company is willing to reward its employees for improvement."

He feels that the new system cuts through the psychological and social approaches to merit rating where management winds up in either an ivory tower or in the cold realm of engineering. Employee development uses the clinical approach to personnel problems. Workers with weaknesses are brought along by means of the "conference method" of emphasizing human relations.

Company Benefits

Then too, the technique seems to have licked the problem of two-way communication between management and employees, Mr. Wiedemann points out.

A bonus advantage of the system is that it gives the company an excellent, up-to-date record of all employees.

On the whole, the technique appears to be removing much of the feeling of insecurity possessed by workers who wonder "what the boss really thinks of me." Reassured, his output is bound to improve.

Employee Development: A Case History Report

■ Scattered through the rating sheet were answers to a number of queries which revealed a flagrant fault in John X's personality. These were the queries and the answers supplied by John's supervisor in the accounting department:

Does things quietly and with dispatch _____ False
Always on the defensive with complaints and alibis _____ Mostly True
Criticizes everybody openly _____ True
A Monday morning quarterback _____ True

John's problem: he talked too much. In other respects, he was a fairly competent worker.

While correcting a minor error in one of John's otherwise perfect balance sheets, the supervisor mentioned that if he hadn't spent so much time talking, he would have rung the bell. At the next merit rating period, the answers to the questions above were reversed.

TACONITE: First Mill Grinds It Out

Armco and Republic's joint venture in northern Minnesota already is shipping tonnage . . . Other plants scheduled for completion within two years . . . Equipment market is ticklish—By T. M. Rohan.

♦ **THE FIRST** big completed taconite plant — Reserve Mining Co.'s \$190 million unit at Silver Bay, Minn. — was completed in the nick of time to gain a full year on the larger Erie Mining Co. project, crippled by the steel strike.

The Reserve plant — jointly owned by Armco and Republic Steel Co.'s—this year has shipped out 2.1 million tons, despite the steel strike interruption. The other new project, Erie Mining Co.'s \$300 million plant at Aurora, Minn., which will be almost three times as big, will not get into production until 1958.

Originally scheduled for operation next year, construction was brought to a standstill by the steel strike and continuing strikes in plants of suppliers and so will lose a whole year.

More Delays

Other taconite plants (IRON AGE, April 12, 1956) are progressing, but have also suffered strike delay. Marquette Iron Mining Co. at Republic, Mich., got into pilot production during the steel strike and will be in commercial production next year. Goal for next year is 2 million tons of pellets but the plant this year will probably fall short of the 600,000 tons expected. This mine is operated by Cleveland Cliffs Iron Co., and jointly owned by them with Inland, Jones and Laughlin, and Wheeling steel companies and International Harvester.

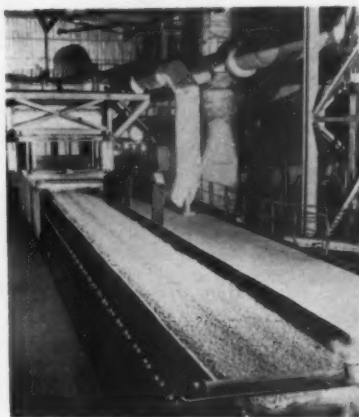
A Canadian project, the Hilton Mines, operated by Pickands-Mather & Co. of Cleveland was delayed by the strike and will get into production late next year. This plant, scheduled to turn out 600,000 tons per year, will be the first one offering taconite pellets on the open market.

It is owned by PM, plus Steel Co. of Canada and Jones and Laughlin Steel Co. Delays in delivery of steel due to the strike have pushed back the start of production from early next year.

Equipment Problems

Taconite is one of the hardest materials ever encountered for mass crushing, requiring a force of up to 56,000 lb per sq in. (psi) compared to 30,000 for granite and 19,000 for limestone.

Taconite is so hard that the finest manganese steel liners used in the crushers flows cold under crushing pressure. But liners have lasted for 1 million tons without replacement.



PELLETIZING furnace bakes pellets at 2400° F. Pellets are cooled and quenched before stockpiling.

Most of the concentrating technology was worked out at the University of Minnesota.

Manufacturers of equipment can only infrequently offer major technical or price advantages over their competition so the scramble for orders is high.

Reciprocity in the mining ma-

chinery business is high, further complicating the sales job. Mining firms are deeply aware of this and equipment contracts specify no endorsement-type advertising. Suppliers also frequently refuse to announce amount of contracts held



STOCKPILING of pellets awaiting shipment to blast furnaces is fed by Reserve's giant ore bridge.

for projects to avoid jeopardizing future sales.

From an operational standpoint taconite production is no bed of roses. On conventional mining, output can be juggled to meet demands by putting in more shovels, trucks and cranes and adding more ore boats.

All Year Round

With decreased demand they can be pulled off the job. With multimillion dollar investments in taconite processing plants, they must keep running for amortization and also will run the year round to avoid employment fluctuations. As a defense measure, unlike direct shipping ores, they can produce the year round and ship by rail when the lakes freeze over, a costly but vital advantage.

SAFETY: Help Employees Guard Vision

Over 10,000 workers suffer eye accidents each year . . . Testing programs and safety campaigns can help cut that toll . . . Getting cooperation depends on making successful psychological appeal to employees.

♦ **VISUAL TESTING** programs, coupled with safety campaigns, pay dividends in industrial production and efficiency by making both employees and employers "vision conscious."

Vision programs can so impress workers with vision consciousness that a greater percentage of them will seek needed optometric services. Resulting improvement in employee vision will almost certainly benefit their performance of industrial tasks.

Other benefits of a visual testing

Division of the Chilton Co., is a company's appraisal of its industrial vision provisions already in existence. One good way of determining additional needs is a questionnaire probing such areas as type of company products manufactured, amount of plant medical and first-aid services available, frequency and extent of current eye testing programs, use of proper illumination and provisions for safety equipment, such as goggles.

Once a program is established best results are obtained by a

men risk a 33⅓ pct cut in salary for the rest of their lives each time they come up with an eye injury.

Nor is accident prevention a simple task. "The fact that the majority of accidents occur in areas judged to be safe," says Dr. Hofstetter, "illustrates one complexity. It has been found that many safety devices produce increases in the number of accidents apparently by reason of the unwarranted sense of safety or security that they provide."

Company measures to protect employees include: (1) painting of installations or plant areas with a warning series of colors (red for danger, green for location of safety equipment, etc.); (2) making sure workers use glasses, goggles and shields; (3) providing proper lighting necessary to reduce unnecessary accidents.

Who Are Wise Owls?

How can employees be stimulated to cooperate in safety campaigns? There are various human traits that can be enlisted successfully in keeping a drive active. They include appeals to the worker's sense of self-preservation, loyalty, responsibility, pride and desire to conform or be rewarded.

The Wise Owl Club, sponsored by the National Society for the Prevention of Blindness, is an example of an effective safety education program. A worker who survives an accident without an eye injury because of wearing safety lenses is eligible to receive and wear a Wise Owl Emblem.

This book — "Industrial Vision" — has been prepared as a guide and text for all those concerned with the problem including industrial physicians, safety and personnel directors and lighting engineers.



THIS ORTHO-RATER, using slides mounted on rotating drums, can provide eye tests right in the plant close to employees' working stations. Scores for each group tested in various job classifications are treated statistically to arrive at standards for a given job.

program are: establishing systematic procedures for detecting eye disorders, providing a means for determining the visual requirements of a job, and measuring other, presumably nonvisual, traits, such as accident proneness, intelligence, and attention.

In the Beginning

Initial step in setting up a testing program, states Dr. H. W. Hofstetter, author of "Industrial Vision," published by the Book

periodic recheck of (1) employees exposed to special hazards; (2) those with poor production records; (3) those involved in accidents; and (4) those in whom original testing indicated a need for a follow-up examination.

Need of industrial safety campaigns is stressed as the book states that "over 10,000 men and women permanently lose part of the vision of one or both eyes as the result of industrial accidents each year." It's estimated that work-



After 6,300,000 indexes Warner & Swasey 1 AC Automatic still holds API thread accuracy!

THE W. C. NORRIS COMPANY, Tulsa, Oklahoma, has proved through 7 years of 18-hour-a-day production that Warner & Swasey Single Spindle Automatics not only are designed to provide extreme accuracy, but that they're built to *hold* that accuracy!

Norris installed the first of their present four 1AC's in 1949 to machine the ends of sucker rods—long rods used in series to actuate pumps in the bottom of oil wells.

This 1 AC roughs and finishes ends of these forged steel rods—including cutting API threads—on a 36-second cycle! Any way you figure it, this 1AC's 6,300,000 indexes are the equivalent of 25 and more years of one-shift service on work cycles more

conventional to this type of machine. And the machine still automatically controls accuracy to meet these high API threading requirements.

Such lasting accuracy is not surprising when you look at the unique design of Warner & Swasey Single Spindle Automatics. Here is engineered simplicity itself! Its big pentagon bar is supported by two wide—and widely spaced—bearings, completely enclosed and protected. Positive interlocking of the spider-guide plate combination further insures rigidity—and repeated accuracy.

Accuracy and dependability of Warner & Swasey Single Spindle Automatics on long runs like those at Norris—plus their ability to pro-

duce small lots—have drastically cut floor-to-floor costs for companies all over the country.

Our Field Representative can show you how these machines will do the same for you! Call him in.

**WARNER
&
SWASEY**
Cleveland

PRECISION
MACHINERY
SINCE 1880

YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS...WITH A WARNER & SWASEY

EXPANSION IN INDUSTRY

Merger:

Jessop swaps 1 for 10 to control Green River.

Jessop Steel Co., Washington, Pa., will invest a minimum of \$1.5 million, in addition to accepting 10 shares for one of its common stock, in order to gain control of Green River Steel Corp., Owensboro, Ky.

Green River stockholders will turn in 662,500 shares in return for the 66,250 shares of Jessop stock.

Although Green River has been operating in the black since Robert R. Estill assumed the president's chair about one year ago, it has liabilities of about \$16.5 million.

Green River attorneys will petition the Federal District Court for approval in compliance with legal requirements on corporate reorganization. This is generally considered to be merely the final necessary formality in the merger.

Among Green River's assets are two 60 ton electric furnaces, a 2500-ton and a 1500-ton press, 24-in. two-high reversing blooming mill and a two-stand bar mill. In addition, the firm is the only steel producer licensed to use the Dornin process for achieving extreme density in steel ingots.

With Jessop funds and management, Green River expects to increase production through the purchase of additional equipment, causing an increase in the payroll of from 25 to 50 pct.

Hitting Atom's Jackpot

A \$23 million contract, calling for production of 500,000 lb of nuclear grade pure beryllium metal, has been awarded to The Beryllium Corp. Deliveries are specified to cover a five year period.

This contract, and others, are a

factor in Beryllium's move to spend \$4 million on a new plant and production facilities. Location of these new quarters has not yet been made known. Meanwhile, other plans call for increased use of recent enlarged capacity at the firm's Reading, Pa. plant.

Beryllium Corp. is a leading producer of beryllium oxide, the basic raw material used to make beryllium metal and beryllium copper alloys. Since the development of atomic energy, beryllium has been used, in its pure form, as a moderator, reflector and cladding material in nuclear reactors.

All-Star Casting

Enlarged facilities for continuously casting bronze foundry alloys are being planned by American Smelting and Refining Co. The expansion—costing over \$1.2 million—will increase the firm's capacity by 50 pct. As a result of the move, two new furnaces will be installed.

Expansion Briefs

Thor Power Tool Co., Detroit; plans new branch in Indianapolis, Ind., 25th in the company chain.

Armco Steel Corp., Middletown, O.; increase the facilities of its Baltimore Research Laboratory for development of stainless steels; cost about \$300,000.

The DeVilbiss Co., Toledo, O.; will expand factory branch in Dallas, Tex.

Yale & Towne Manufacturing Co., New York; will construct a new manufacturing plant in San Leandro, Calif.

New Headquarters

Youngstown Sheet and Tube Co. will build a new three story general office building on a 52 acre plot just south of Boardman Center on Market St., Youngstown, O.

The new edifice, with 183,000 sq ft of floor area, is expected to be ready for occupancy late in 1957.

Building will feature complete air conditioning, large assembly room, recreation rooms, garage and escalators.

Home in Oklahoma

New tantalum-columbium plant costing \$6.5 million will be built by Fansteel Metallurgical Corp. at Muskogee, Okla.

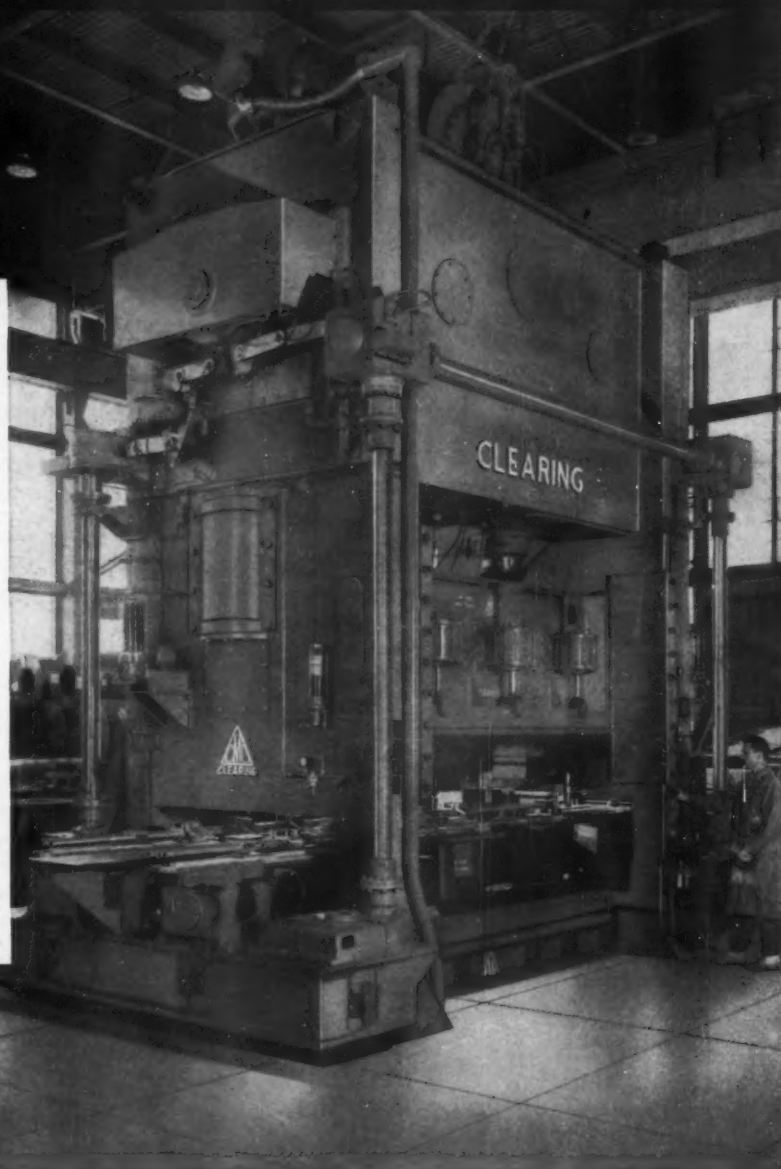
Facilities are designed to increase present tantalum capacity by 50 pct and columbium capacity by 150 pct. Initial construction will include two chemical buildings, a sintering building and a service building comprising about 95,000 sq ft of floor space.

Kelsey-Hayes Wheel Co., Detroit; subsidiary in Utica, N. Y., Drop Forge and Tool Corp.; will build new plant for machining aircraft jet engine blades, buckets and vanes.

General Electric, Aircraft Products Dept., Johnson City, N. Y.; expanding product line responsibility, plant facilities and engineering manpower.

National Carbon Co., division of Union Carbide and Carbon Corp., New York; plans to build a new plant for manufacture of fabricated carbon products; has an option on tract of land near Lawrenceburg, Tenn.

A Variety of Work plus Transflex Feeding?



Ask JARECKI about the new CLEARING TRANSFLEX



Closeup of Transflex feed which is now adjusted to automatically feed an automotive valve cover stamping.

Today Jarecki Corporation is running valve covers on this new Clearing Transflex in their Grand Rapids Plant. Tomorrow? Who knows? Jarecki is a job shop with a wide variety of orders to fill and tomorrow may bring an automotive or appliance stamping run where delivery and quality are vital. That's why Transflex—Clearing's new concept of flexible automation—found immediate acceptance at Jarecki. Their new 600 ton press gives them the advantages of automatic transfer feeding, yet it's no single-purpose machine. Feed fingers change easily to accommodate different sized parts; the feed stroke is adjustable to take a wide range of jobs. Knockouts are universal and cushions also adjust laterally in the bed. If you have need for increased efficiency in your stamping operation, but have always thought of transfer presses as single-purpose machines, find out about Transflex. Call on a Clearing engineer for the full story.

CLEARING PRESSES

THE WAY TO EFFICIENT MASS PRODUCTION

CLEARING MACHINE CORPORATION • Division of U. S. Industries, Inc.
6499 W. 65th Street, Chicago 38, Illinois • Hamilton Plant, Hamilton, Ohio

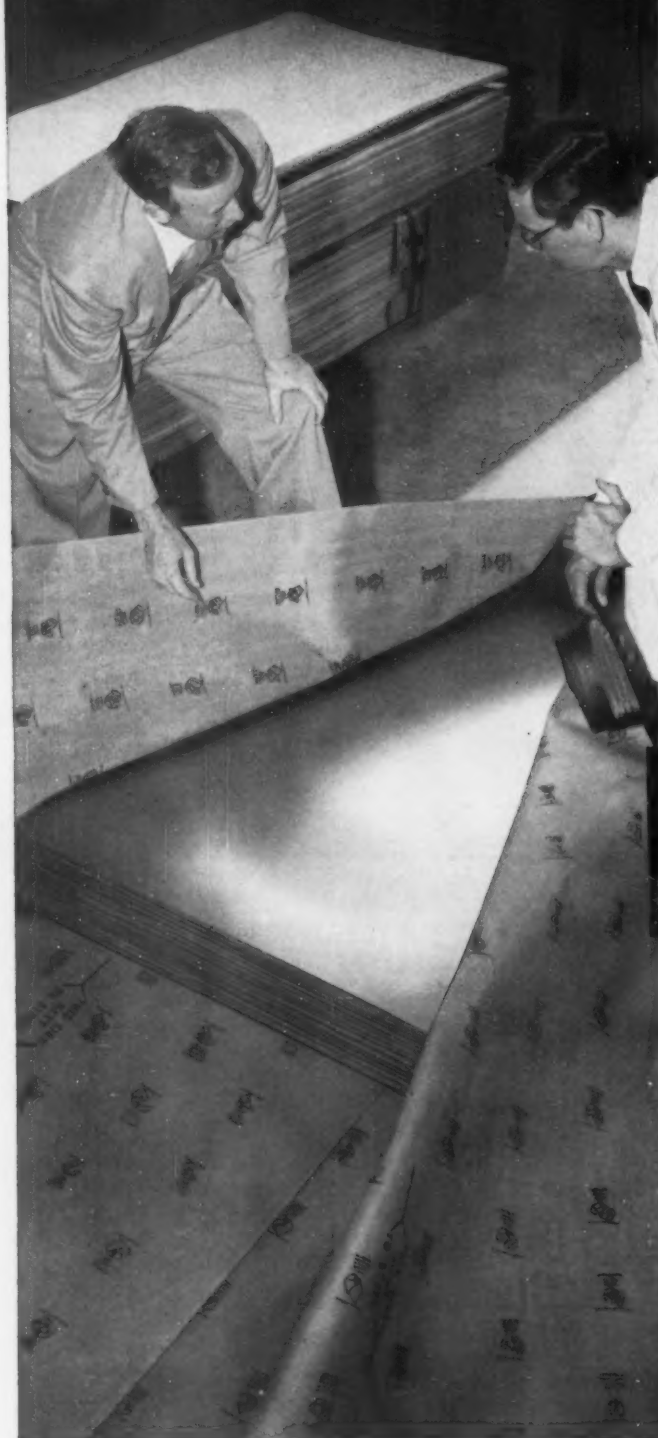


how to rustproof steel in warehousing

When unusual times and conditions make it necessary for you to warehouse any kind of steel, even such sensitive steels as black plate and cold rolled, here's how you can combat the rust problem. Wrap your steel in Ferro-Pak, Cromwell's volatile corrosion inhibitor paper. Non-toxic chemical vapors from Ferro-Pak coat the steel with an invisible film that makes it impossible for rust to get the slightest foothold.

Even under adverse conditions, such as outside storing or shipping, Ferro-Pak provides complete protection. It is waterproof, strong, yet highly flexible and easy to handle. The chemical rust inhibitor is compatible with oil and stays effective for long periods even when the humidity soars.

Whether you're a shipper or a buyer of steel, it will pay you to specify Ferro-Pak wrapping wherever rust is a problem. For an interesting idea brochure on many uses for Ferro-Pak, write Cromwell Paper Company, 4803 South Whipple Street, Chicago 32, Illinois.



How to rustproof a freight car—Ferro-Pak is used to line sides of car and to interleave coils, transforming ordinary freight car into huge rustproof package.



How to rustproof black plate—On this light gauge, dry, uncoated steel, rust can start from a fingerprint. Ferro-Pak keeps black plate rust-free even when the humidity soars!

FERRO-PAK®

by Cromwell

For over 38 years—
"Paper Engineers" for Steel

REPORT TO MANAGEMENT

Competing With Uncle Sam

The Hoover Commission Report isn't in favor of government engaging in harmful competition with private industry, but there are no holds barred in its recommendations that the government compete with industry for competent executives and engineers.

Since the Commission made the last of its 314 recommendations to Congress 14 months ago, 179 business-type establishments have been closed or sold by the Defense Dept. Included were synthetic rubber plants, a shale oil plant at Rifle, Colo., and a number of stores and hotels operated by the Alaska Railroad.

Among the 31 pieces of Hoover Report legislation approved by Congress in 1956, was the Executive Pay Act, now Public Law 854, which increased the salaries of 647 high-level federal administrators and policymakers. Raised were: cabinet officers' salaries from \$22,500 to \$25,000; ceiling for career civil servants from \$14,000 to \$16,000; ceiling on top scientists' salaries to \$19,000.

The aim is to attract and hold more competent executives. Turnover in the upper brackets is high because industry can so easily outbid the government. Mr. Hoover, in fact, made his own study of salaries paid by typical private companies which he then compared to federal pay scales. He found that the government would need 14,000 employees at \$15,000 a year and over to match industry's ratio; yet it had only 633 as of January, 1956.

"If we want executive talent and character to stay in government we must do much better than we are doing now," Mr. Hoover said. Public Law 854 actually adds to the budget instead of reducing it—the avowed purpose of the Hoover Report. But as Mr. Hoover points out, "A good top executive at any salary can save ten times his salary."

Taxpayers are much interested

in seeing that tax dollars are administered by competent civil employees. Yet private industry seeking top talent for its organizations may not be happy over competition from the government in this vital area. It's a dilemma which poses the problem, "Which comes first?" Meanwhile, the shortage continues.

At any rate, the major economies which eventually will result from the 31 Hoover Report recommendations thus far adopted are expected to far outweigh increased expenditures which the commission suggested in a few cases. A potential saving of \$532,600,000 in 1956 is anticipated as a result of the Report. That's a considerable return on the \$2.8 million appropriation to pay for the study.

August Was A Record Month

In the echelons of wage earners, the average weekly paycheck of factory production workers rose by almost \$1 during August, from \$78.80 to \$79.79—a new August record.

Durable goods industries reported an over-the-month gain of \$1.85 in weekly earnings. Nondurable goods industries posted an over-the-month loss of 22 cents in the weekly paycheck, attributed to shorter hours.

The factory workweek rose seasonally from 40.0 to 40.3 hours between July and August as manufacturing plants responded to the usual autumn pickup. Industries showing better-than-average activity were ordnance, non-electrical machinery and instruments.

Factory employment

was at almost 17 million last month. That's 150,000 more than a year ago and 670,000 above the July level. Apart from the pickup of 365,000 in primary metals, accompanying the end of the steel strike, changes in employment were largely in line with seasonal expectations.

INDUSTRIAL BRIEFS

For Mica . . . A group of Sylacauga, Ala., business men have incorporated the Mica and Minerals Corp. of America, and plan early construction of a mica processing plant at Hartwell, Ga. The company has completed registration with the Securities and Exchange Commission for the sale of 570,000 shares of common stock. Plant investment will be more than \$300,000. Headquarters of the company will be at Hartwell, Ga.

Sells Shells . . . Shell Process, Inc., West Springfield, Mass., manufacturers of shell molding and allied equipment, has appointed Edwin A. Swensson Co., Canadian representative for Western Ontario.

Poles Apart . . . Two regional sales offices have been established by the Tractor and Implement Div., Ford Motor Co. in Memphis, Tenn., and Hartford, Conn.

IBM Smorgasbord . . . IBM electronic data processing service will be extended throughout Scandinavia with the opening in Stockholm of Europe's fifth Data Processing Center. This further expands IBM's Scandinavian facilities of sixteen sales offices and four plants for the manufacturing of accounting machines, typewriters and punched cards.

Budding Business . . . The Canadian Car and Foundry Co., Ltd., Montreal, has been licensed by The Budd Co., Phila., to build and sell all-stainless steel railway passenger cars; railway disk brakes; and Budd Rolokron, an anti-wheel slide device. The agreement will permit the Canadian manufacturer to produce all types of stainless steel passenger equipment for the railroads of Canada.

Call Your Shots . . . "How Can Gray Iron Foundries Help . . . Castings Buyers?" is the title of a questionnaire being mailed to several thousand purchasing directors in metalworking industries. Members of the Gray Iron Foundries' Society want to know how they can better serve their customer industries and they are going to the men best qualified to say—the buyers of castings.

Warehouse Warming . . . To dedicate its expanded plant at Jersey City, Joseph T. Ryerson and Son will hold open house for customers and friends on September 20.

Capacity Rose At Sharon . . . Two new divisions have been set-up at Sharon Steel Corp.; a Plate and High Strength Steel Sales Div., and a Market Research Div., to handle the general expansion program and development of new products as a result of the company's increased steel tonnage capacity.



"Take a letter to the safety director."

Hypo . . . Borg-Warner Corp. has developed a gasoline fuel injection system for internal combustion engines. The system, designed to increase engine power, provide fuel economy, and improve performance has been exhibited by Borg-Warner's Marvel - Schebler Products Div.

New Field For Sheffield . . . The Sheffield Corp., Dayton, O., has established a Research and Development Div. devoted exclusively to instruments, controls, machines and systems for "autometrology"—combining machining, motion or memory with automatic measuring.

Place In the Sun . . . Pratt & Whitney Aircraft, East Hartford, Conn., Div. of United Aircraft Corp., will build an auxiliary aircraft engine plant 17 miles west of Palm Beach, Fla. costing a minimum of \$40 million. The plant site, obtained in an agreement with the Florida Game and Fresh Water Commission, consists of 7,000 acres.

On the Verge of a Merge? . . . The why and how of corporate mergers will be investigated at a special conference on Mergers and Acquisitions for Growth and Expansion to be held by the American Management Association's Finance Div. Close to 600 are expected to attend the sessions held at the Hotel Roosevelt from Oct. 31-Nov. 2.

Cross Over the Bridge . . . Daniel S. Karp and John Lesser, formerly chief executive officers of Karp Metal Products Co., Brooklyn, have formed the Karp, Lesser & Co., Inc., serving as engineering and management consultants to the precision sheet metal fabrication field and allied industries. The firm's offices are located in New York City.

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here's how

WEIRZIN

electrolytic zinc-coated steel

**seals it against rust
and corrosion**

Decorative color finishes adhere to Weirzin Electrolytic Zinc Coated Steel as though they were part of it.

The secret is in Weirzin's ductile zinc coating, which is bonded to the steel so tightly that it remains intact even under the most severe conditions such as high heat or humidity, deep drawing, stamping or forming. Result: no underfilm rust or corrosion.

Thus paint, enamel, lacquer or ink surfaces cannot be attacked from underneath; hence they cannot crack, chip or flake. No wonder Weirzin products look better, last longer, sell faster!

Weirzin is available with or without chemical treatment in coils or cut lengths, in all regular widths and gauges. If you would like specific information on the many ways in which Weirzin may benefit your product, please fill in and mail coupon (right) today.



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a division of

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WEIRTON STEEL CO., Weirton, West Virginia

I would like to know more about Weirzin.

My product is _____

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POSITION _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____



AUTOMOTIVE ASSEMBLY LINE

GM Strikes First With Fuel Injection

Corvette will get first U. S. fuel injection system . . . Ford and S-P also have irons in the fire . . . Stylists hope it spreads to bread and butter lines . . . Not all agree on system's merits—By T. L. Carry.

◆ THE NEWS that Chevrolet is going to introduce fuel injection on its Corvette may not have caught the industry napping, but, as usual, General Motors has the competitive advantage on other automakers.

It has been said many times before, but it is still true that there are no secrets in the automobile industry. Competitors always know what the other fellow is doing or planning on doing. The only competitive jump to be gained is one of timing.

If this is the case, GM has stolen a march with fuel injection. The company will be the first to come out with it just as it was a year ahead of everyone else with the wraparound windshield.

Other automakers have been toying with fuel injection for years. The time may not be far off when two other producers, Ford and Studebaker-Packard, will adopt a form of fuel injection on a limited basis.

Ford's Approach . . . Holley Carburetor Co. recently signed a license agreement with Joseph Lucas Industries, Ltd., of Birmingham, England, covering gasoline injection for car engines.

Holley's relations with Ford have always been close and qualified observers in Detroit say that it would not be surprising if Ford were to come up soon with some type of fuel injection for its Thunderbird.

At the same time, Studebaker-Packard will obtain rights to the Daimler-Benz system, if and when

Curtiss-Wright concludes an agreement with the German company.

There is a constant argument going on between powerplant engineers and stylists as to the relative merits of a fuel injection.

Style a Factor . . . Stylists claim, and rightly so, that elimination of the carburetor and air cleaner would give them much more freedom in the design of a car. They add that fuel injection is also much more efficient than the old method of carburetion.

Engineers claim that this is not so. They point out that almost any car with a carburetor can be tuned until it is as efficient as one equipped with fuel injection.

At normal driving speeds, according to engineers, fuel injection is no better nor worse than a carburetor. Benefits are not realized until an engine hits 5000 rpm and nobody drives at that speed for any extended period of time.

Not Inexpensive . . . In short, the engineers claim that the few benefits to be derived from fuel injection are not worth the extra costs involved in production.

Regardless of the pros and cons on the subject, it appears that stylists will eventually win the argument.

The trend toward lower silhouettes in autos will eventually eliminate the carburetor.

But like any other innovation, fuel injection is going to cost a lot more than carburetors. Cost is a problem that cannot be solved in a short time.

That's why Chevrolet is starting out with the system on a limited basis. Once the costs are cut to size, just about every producer will be using some form of fuel injection.

Ford's Progress

Ford's joining of the Automobile Manufacturers Assn. is only one of a series of major changes that have taken place since the founder's grandson has taken control of the company.

Membership in the AMA was bitterly opposed by the elder Henry Ford ever since it was founded in 1913.

Until now, Ford was the only



"You've just bought yourself a used car, mister. Hop in and I'll give you a push!"

"Automated" chromium bath helps cut plating costs

♦ Chemical control greatly simplified with Unichrome SRHS® Chromium Plating Process

♦ Manhours saved . . . bath automatically kept in optimum balance . . . consistently good results assured

Remarkable feature of SRHS Solution is the *self regulation* of important chemical constituents. In effect, this means that control has been automated.

OPERATION IS EASIER

Unlike ordinary chromium, there's no need to make lengthy analyses of samples of the SRHS solution . . . no need to lose time determining additions to the bath to bring it up to proper balance for good plating. Instead, the unique formula of the SRHS compound permits a reserve of undissolved chemical to be available in the tank and ready to dissolve automatically in just the right amount needed to replace losses. Just a simple hydrometer reading tells when to add more SRHS compound.

By maintaining themselves continuously in peak plating balance, the SRHS baths provide not only a more foolproof operation, but also better results.

RESULTS ARE IMPROVED

Through this *automated* control of plating balance, the unusual benefits of SRHS are achieved to the fullest. Plants plate up to twice as fast as with ordinary chromium . . . save on power consumption . . . gain more production capacity without extra equipment . . . and reduce "burning" and "missing" (major causes of rejects).

This process is just one of Metal & Thermit's many Unichrome processes and materials which provide opportunities to cut your finishing costs . . . opportunities to turn out a better product through a better finish. We'd welcome the chance to work with you.

Unichrome is a trade mark of Metal & Thermit.



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Produced by the proven Sendzimir process, JALZINC has a tight, uniform coating that resists cracking and flaking. The high lustre finish greatly improves the appearance of your end product. JALZINC is available in a wide range of gages and widths in both cut lengths and coils.

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J&L inspector examines a roll of 18 gage JALZINC as it is coiled on a reel of the new Sendzimir continuous line.

Jones & Laughlin
STEEL CORPORATION · PITTSBURGH

Automotive Production

(U. S. and Canada Combined)

| WEEK ENDING | CARS | TRUCKS |
|----------------|---------|--------|
| SEPT. 15, 1956 | 66,322 | 20,299 |
| SEPT. 8, 1956 | 50,246 | 16,316 |
| SEPT. 17, 1955 | 124,689 | 21,805 |
| SEPT. 10, 1955 | 82,564 | 15,982 |

*Estimated. Source: Ward's Reports

company that did not belong. Non-membership was one of the hard and fast rules the company's founder established.

But other rules have been changed in recent years. Today, you can buy a Ford in any color—including black. The company is also selling its stock and dealing openly with Wall Street, which old Henry Ford opposed so bitterly because he was once denied its financial backing.

In addition, a Wall Street broker, Sidney J. Weinberg, is on Ford's board of directors.

Behind the Scenes

The history behind Ford's refusal to join AMA is probably one of the most interesting phases of the automobile industry.

The opposition stemmed from Ford's bitter fight with one of AMA's predecessors to avoid paying royalties to the holders of the Selden patent rights.

Ford refused to pay any royalties. He was sued for patent infringement and finally won his case on an appeal to a higher court.

The elder Mr. Ford never forgot the incident and he refused to join the AMA.

Outlook:

Clear Sale-ing ahead
says Lincoln

Here's the way Lincoln Div., Ford Motor Co., believes the outlook for the automotive industry stacks up: fourth quarter 1956—extremely good; 1957 model run—even better.

There's a good reason why Lincoln is waxing optimistic. The division is currently experiencing the best year in its history. During the first 7 months of this year

sales were 35 pct better than they were for the corresponding period in 1955.

Ben D. Mills, division manager, has no illusions about being able to overtake Cadillac, but will be content if the division manages to hang on to its present penetration of the market. As Mr. Mills puts it, "We have made some significant gains and we have no intention of losing ground."

Actually, Lincoln sales so far this year have amounted to only .76 pct of the total market. The division's goal for 1957 is at least 1 pct of the market.

Henry B. Daniels, Lincoln general sales manager, estimates that 7 million cars will be sold next year. Thus, he expects Lincoln to account for at least 70,000 units.

At the present time, Lincoln is in the midst of a transition period. The division has been separated from Mercury and hopes to be making cars in its own assembly plant in nearby Novi, Mich., by the middle of 1957.

Employment Higher

At the same time that Lincoln officials were predicting at least

AUTOMOTIVE NEWS

7 million sales next year, Ford and General Motors announced that employment in their plants would hit near record levels by next December.

John S. Bugas, Ford industrial relations chief, says that the company's hourly employment over the next four months is expected to rise at least 10 pct. Mr. Bugas predicts that the company will be hiring new employees in addition to calling back all its old workers.

General Motors says that it expects all laid off workers with at least 90 days seniority to be back on the job by Christmas.

On the surface, the industry, as usual, is planning big for 1957. Predictions regarding production and sales will be flowing freely from now until the time the last new car is introduced to the public. All the prophets will have one thing in common. Their remarks regarding the industry will be very rosy. However, automakers learned a bitter lesson last year.

THE BULL OF THE WOODS

By J. R. Williams



COMPLETE *Finishing* SYSTEMS

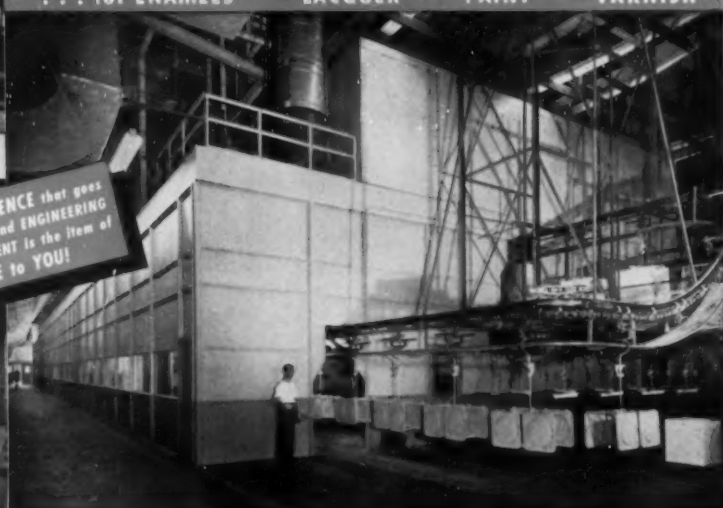
... for ENAMELS • LACQUER • PAINT • VARNISH



Mahon Metal Cleaning and Rust Proofing Machines at G.E. One is Seven-Stage for white parts. The other Six-Stage for black parts.



One of the two Mahon Dry-Off Ovens at the Exit End of the Mahon Metal Cleaning and Rust Proofing Machines at G.E.



General view showing exterior housing of the Complete Mahon Finishing System in General Electric's Home Laundry Equipment Department at Louisville, Kentucky. This Housing encloses all processing and painting operations. Finish Baking Ovens are located above the enclosure.



One of two Mahon Hydro-Filter Spray Booths in the Complete Mahon Finishing System at General Electric Co., Louisville, Ky.



Through the glass you see the interior of the Mahon Automatic Electrostatic Spray Booth, where finish coat enamel is applied.

... the EXPERIENCE that goes into the PLANNING and ENGINEERING of MAHON EQUIPMENT is the item of GREATEST VALUE to YOU!

More and More HOME APPLIANCES Receive Their FINE FINISH in Modern, COMPLETE MAHON FINISHING SYSTEMS!

In the Home Laundry Equipment Department of General Electric Company, Louisville, Kentucky, a Complete Mahon Finishing System produces the fine finish demanded by one of the world's largest home appliance manufacturers. The system includes an enclosure, which houses all metal processing and painting equipment, with Finish Baking Ovens, Heating Units, Filtered Air Supply and Exhaust Fans located above ... it is a complete, ultramodern finishing system combining and coordinating all major units of equipment and other essential facilities into an efficient, smooth-running, economical production operation. There are actually three finishing lines in this system: One is a flow coating line for black parts. Another flow coating line applies the first coat of enamel—both Flow Coaters are equipped with controlled atmospheric paint surface conditioning chambers in the drip zone. The third line is a combination manual and automatic electrostatic spray for the finish coat of enamel. If you are contemplating new finishing equipment, you, like thousands of other quality-minded manufacturers, will find that Mahon engineers are better qualified to advise you on both methods and equipment requirements ... and better qualified to do the all-important planning, coordinating and engineering of equipment—which is the key to fine finishes at minimum cost. You will find also, that Mahon equipment is built better for more economical operation over a longer period of time. Mahon will furnish your complete system on one contract ... undivided responsibility for the entire job safeguards you against complications which may upset your production plans and subsequent schedules. See Sweet's Plant Engineering File for information, or write for Mahon Catalog A-656.

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Engineers and Manufacturers of Complete Finishing Systems—including Metal Cleaning, Pickling, and Rust Proofing Equipment; Hydro-Filter Spray Booths, Dip and Flow Coaters, Filtered Air Supply Systems and Drying and Baking Ovens, Cooling Tunnels, Heat Treating and Quenching Equipment for Aluminum and Magnesium, and other Units of Special Production Equipment.

MAHON



Congress Moves Toward Administrative VP

Problem of easing president's work load will be looked at thoroughly by Congress . . . Administrative vp would be appointed by president, have job of handling routine and carrying out policy—By G. H. Baker.

♦ CONGRESS next year will take a close look at the tremendous load of paper work faced by all presidents of the United States, and as a result may finally create a new job—that of Administrative Vice President of the U. S.

Influential members of Congress on both sides of the political aisle are expressing themselves in favor of the creation of this new position, and are now inclined to push a legislative drive in 1957 for setting up the new position, regardless of who is to be President.

Ex-President Hoover and former President Truman have gone on record as favoring any means of relieving the Chief Executive of the staggering burden of paperwork and burdensome details that is piled on his desk daily.

Presidential Appointment . . .

The "Administrative Vice President" would be appointed by the President and would be subject to Senate approval. His would have no authority to fashion new policies. His function would be entirely to carry out policies and to perform duties assigned him by the President. He could negotiate what Mr. Hoover calls "minor conflicts" within the hierarchy and in other ways keep small-fry problems out of the President's hair.

As Mr. Hoover puts it, the true purpose of creating this new administrative job should be twofold: To lessen the physical strain on the President, and to allow the President more time to determine executive policies and at the same time to permit him to get out from under unimportant details.

Fair Trade Fades

You can expect to see a growing number of appliance manufacturers follow Westinghouse's lead and abandon so-called "fair trade" pricing. "Fair trade" sounds good on paper (maintain good-will among retailers by maintaining a fixed price) but it's rapidly coming apart at the seams in today's rough-and-tumble scramble for the consumer's buck.

Westinghouse stopped "fair trading" its appliances a year ago, and recently announced that its appliance sales had "soared" in the past 12 months, notwithstanding its costly 1955 strike and some grumbling from retailers. Westinghouse makes it clear that it has nothing against "fair trade." But in today's "hard sell" market, any economic philosophy embracing "soft competition" is just plain old-fashioned and out of place.

Congress probably won't act to tighten up the federal "fair trade" (McGuire) law next year, as a result. Belief is growing here that "fair trade" is becoming more and more of an academic theory, less of a realistic selling principle.

Help for Homes

The Eisenhower Administration is under considerable pressure to lend a hand to the lagging home construction industry. Beset in recent months by a sharp fall-off in sales of new homes, builders blame their woes on the government's tight-credit policies.

Except for the West Coast, where new homes still are selling at a healthy rate, sales of new houses are way off in all parts of the nation. Total construction of new homes this year evidently is going to fall below the 1,000,000-mark for the first time since 1949.

Save Those Statistics—and Statisticians

■ Statisticians are forming a national "conference" to protect what they consider vital government statistical programs.

To some extent the move is defensive. Idea was planted in 1953 when the figure jugglers mobilized in hastily assembled groups to fight a threat of congressional curtailment of some "essential key benchmark indices" on which many statistical forecasts are based.

They weathered the storm,

but some of the persons who found themselves allied in that fight have become the nucleus from which the new conference is formed.

The new group hopes to call a general meeting in the next few months to formally establish their conference.

Purpose is to conduct a continuing study of coordinated overall statistical requirements and the degree to which they are being met by existing government programs.



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are "naturals" for Cleveland's Custom Production... Applying 40 years experience making *Top Quality* Cap Screws...

Simplify your special parts production problem. Your quantity-run designs are handled by Cleveland to your complete satisfaction, with savings in time, cost and machining. And they're stronger, more dependable as made by our Kaufman Process with our long specialized experience in cold extrusion and hot heading.

We work to your exact design and materials specifications—or stand ready to offer our suggestions for improvement in either, if you want

them. Watchful control follows your job; preparation and testing of material, checking in process, and final inspection, to assure you parts as you want them—physical properties as desired, uniform, accurate to close tolerances, concentric, correct pitch diameter, proper heat treating, and other limits that may apply.

Find out how Cleveland Custom Service can help you in your special parts production. Write for folder on special headed and threaded products.



All of the special parts illustrated were cold-forged by the Kaufman Double Extrusion Process.

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Why San Francisco Is Good Market Bet

First in per capita income and savings, city has natural advantages as market and headquarters center . . . New firms added 10,000 jobs in seven years . . . Metal industry's product value up 70 pct—By R. R. Kay.

◆ **WHEN PEOPLE** are doing well financially, they make rich markets. That's San Francisco—first in the U. S. in per capita income and savings.

Last year, the city's total effective buying power was almost \$2 billion. That breaks down to \$2,403 per head—the highest among the nation's large cities where the average ran a little over \$1,600.

Commuters a Factor . . . Sweetening up the San Francisco market picture still more are the 290,000 people who enter the city daily and boost the number of customers to over a million. This includes 115,000 persons regularly working there but living in the nearby "bedroom" communities.

What's more, the city, now the 11th largest in the U. S., ranked among the top leaders in population gain since 1940. It led the pack in growth per square mile.

Zooming Up . . . A nose count at the first of this year showed San Francisco's population spurted to 807,000 vs 775,000 in the 1950 U. S. Census. It's pegged to zoom to 830,000 by 1960 and 900,000 a decade later.

But the city's growth doesn't tell all. The nine county area, of which San Francisco is the hub, is packing in new residents at the rate of more than 8000 a month. For northern California it's over 13,000 every 30 days.

It's a Natural . . . Industry and job opportunities are keeping pace with this swift growth. Execu-

tives of industry, trade, and commerce all across the country are recognizing the incomparable strategic position of San Francisco. They're getting keen to its natural advantages as a market and headquarters center to highly diversified resources and facilities.

The city, long noted for its natural air conditioning, boasts it's the ideal climate for industry. And industry is taking the hint. The just-released U. S. Census of Manufactures (1954) shows value added in the Greater San Francisco area jumped 60 pct over 1947 to \$1.7 billion.

Close to 500 new industrial plants set up shop in the period, and they created 10,000 new jobs. Payrolls, too, shot up with this

gain—from \$500 million to \$800 million. And more than \$115 million was invested in new plants and equipment.

Metals Important . . . The primary metal industries contributed their share to this feverish growth. The value added by this group moved up almost 70 pct to \$104 million. Close to \$3.5 million was spent by these companies for new plant and equipment. They gave jobs to 11,000 workers, with a payroll of \$55 million.

Fabricators of metal products increased their value by 86 pct. The total, \$155 million, meant jobs for 20,000 people with a payroll of \$91 million; and new capital expenditures of \$8.7 million.



FOUR fuel-hungry Grumman F9F-8 Cougar jet fighters, like piglets at feeding time, get sustenance simultaneously, in less than five minutes, from a Convair R3Y-2 Tradewind, first seaplane tanker capable of this feat.

MARVEL NO. 8 BAND SAW

**makes a tough job
EASY...**



**FLOOR TO FLOOR IN 5
HOURS...no special jigs,
fixtures or set-up required**

The versatility, simplicity of operation and unmatched efficiency of a MARVEL No. 8 Universal Metal Cutting Band Saw makes it the best all-around saw you can buy.

Take the job illustrated, as an example. Three equally spaced re-entrant cuts were required to segment a large, heavy die forging. The work was merely placed on the table between the vise jaws with the first lay-out line positioned to bisect the blade. Feed pressure was set on the direct-reading scale and the cut started. On a MARVEL No. 8, the work is always stationary and the blade is fed into the work; the cutting edge of the blade is always square with the table throughout its full feed traverse, which eliminates the need for special fixtures. The pre-set Automatic Overload-Relief Power Feed kept the blade moving into the work only as fast as it could freely remove the metal; as the vertical length of the cut decreased, the blade was automatically fed faster, thus increasing cutting speed. Upon completion of a cut, the blade was rapidly returned to its starting position by a rapid traverse handwheel located at the operator's position. Succeeding cuts were made in the same manner, with the same ease and speed.

Jobs like this aren't done every day, but they serve to emphasize the versatility of the MARVEL No. 8, a truly universal metal cutting saw. If you cut, machine or fabricate metal, this is a sawing machine you should know about. Write for catalog.

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SAWS
Better Machines—Better Blades

S-1302



How Well Do You Know Your Machine Tools?

Don't scrap plans for product diversification because retooling looks too expensive . . . First get to know the built-in versatility of present equipment . . . If flexible enough it can be revamped—By E. J. Egan, Jr.

♦ IT'S REASONABLE to assume that a fair number of plans for diversifying product lines suffer quick deaths because the required investment in new machine tools seems too high.

But is new equipment actually needed in many of these cases? A provocative suggestion that existing tools can often take on additional work loads is offered by Thomas R. Rudel, president of Rudel Machinery Co., Inc., New York.

Mr. Rudel told the annual Eastern Plant Management Conference of the National Metal Trades Assn. that built-in versatility of modern machine tools is a most valuable aid to product diversification. He said that there are a host of machine tools with unused capacity and potential in many metalworking plants, particularly those which have replaced or improved obsolete tooling regularly.

Find Out First . . . He warned against negative decisions on product diversification that are made without consulting machine tool builders, tool engineers and supervisors—even machine tool operators. He emphasized that expert knowledge of what existing machine tools can do can be most important to final decisions about new product lines.

"No matter how attractive the market possibilities of a new product may look," Mr. Rudel said, "no well managed company leaps into a situation in which it can't manufacture the additional product at a profit, with something reasonably close to its present labor force, tools and plant facilities."

If It's Versatile . . . "Careful examination of existing tooling will, in many cases, show that it is flexible and versatile enough to be . . . adapted to many new product uses—with comparatively modest investment for new components, fixtures and accessories," he asserted.

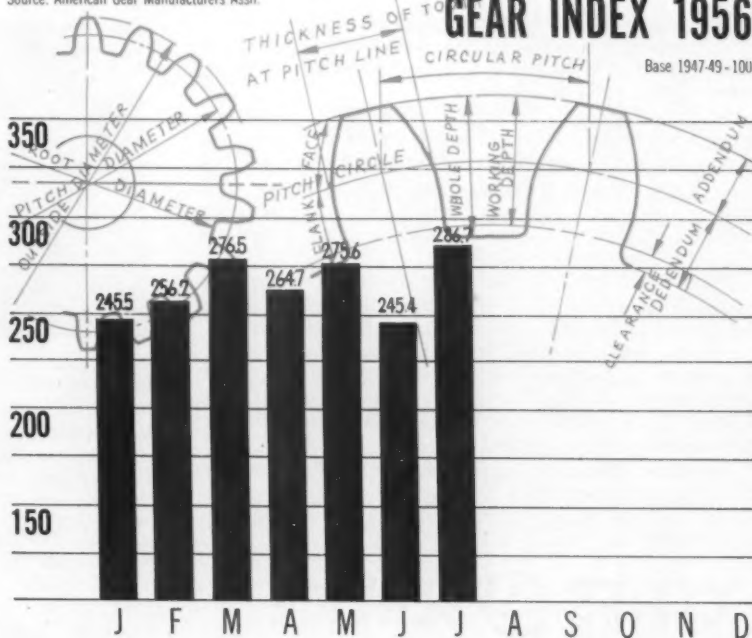
Mr. Rudel's views on maximum utilization of modern equipment should interest builders of general purpose machine tools. To some extent, their claims that new models of standard machine tools are better than ever have been drowned out by the hue and cry that "this is the automation age."

It's not that there's anything

wrong with automated metalworking operations where the equipment cost is fully justified by the type of product and the output volume required. But a number of early automation enthusiasts learned to their sorrow that such setups were often too specialized, too inflexible.

July Was Tops . . . July index of 286.7 on the accompanying chart shows that activity in the gearing industry for that midsummer month was 16.8 pct above the June level. For added significance, word comes from American Gear Mfrs. Assn. headquarters that July was the biggest single month ever racked up.

Source: American Gear Manufacturers Assn.





FAIRMOUNT GLASS WORKS, INC.,
INDIANAPOLIS, IND.

"We make combustion adjustments in minutes with the Cities Service Heat Prover!"

700 employees . . . 27 acres of plant facilities . . . and a yearly production of 288,000,000 bottles—that's Fairmount Glass Works at Indianapolis, Indiana, a beehive of activity where delays can't be tolerated.

So, when furnace combustion adjustments consistently caused as much as a day's delay and gave poor accuracy, Fairmount had to find something better fast! And they did . . . in the form of the Cities Service Heat Prover. This unique, portable testing instrument makes simultaneous readings of oxygen and combustibles, keeping a constant check on combustion conditions.

Thus, Fairmount's operators are now able to adjust the amount of combustion air to the amount and kind of gas being used . . . and they do it, port by port, in minutes!

In addition, the Heat Prover has proved virtually indispensable in shifting furnaces from producer gas to gas made outside the firm. Says Plant Superintendent Cedric C. Rau, "It's one of the most useful, versatile, and accurate instruments we've ever seen."

The Heat Prover is supplied and maintained free by Cities Service. For further information regarding its availability and uses, write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.



Checking Combustion in Glass-Melting Furnace, a Fairmount employee uses the Cities Service Heat Prover for faster, more accurate adjustments. The instrument is supplied free by Cities Service.

Production's Never Bottled Up at Fairmount Glass Works. They produce 288,000,000 bottles a year, use 225-250 tons of glass daily, with many machines turning out 100 bottles a minute!



CITIES SERVICE
QUALITY PETROLEUM PRODUCTS



The Iron Age

SALUTES

James MacGregor

From a small engineering service, he and his brother, Charles built their company into an outstanding auxiliary mill equipment business in just six years. Their story reads like a Hollywood script.

Jim MacGregor is starting to crowd the big boys. His York-Gillespie Manufacturing Co. of Pittsburgh has gained a solid foothold in the auxiliary steel mill equipment field. In a line where an established name is almost a must, he has taken just six years to parlay a 15-man shop into a million dollar concern with entry to the largest mills.

The story behind his company's growth reads like a Hollywood script. In 1949, Glasgow-born Jim MacGregor and his brother, Charles, were sitting in their office looking out over 20 empty drawing boards. Their young engineering firm had been doing fine until the steel labor dispute of '49 began drying up business. They were down from 20 men to two, backed up against the wall.

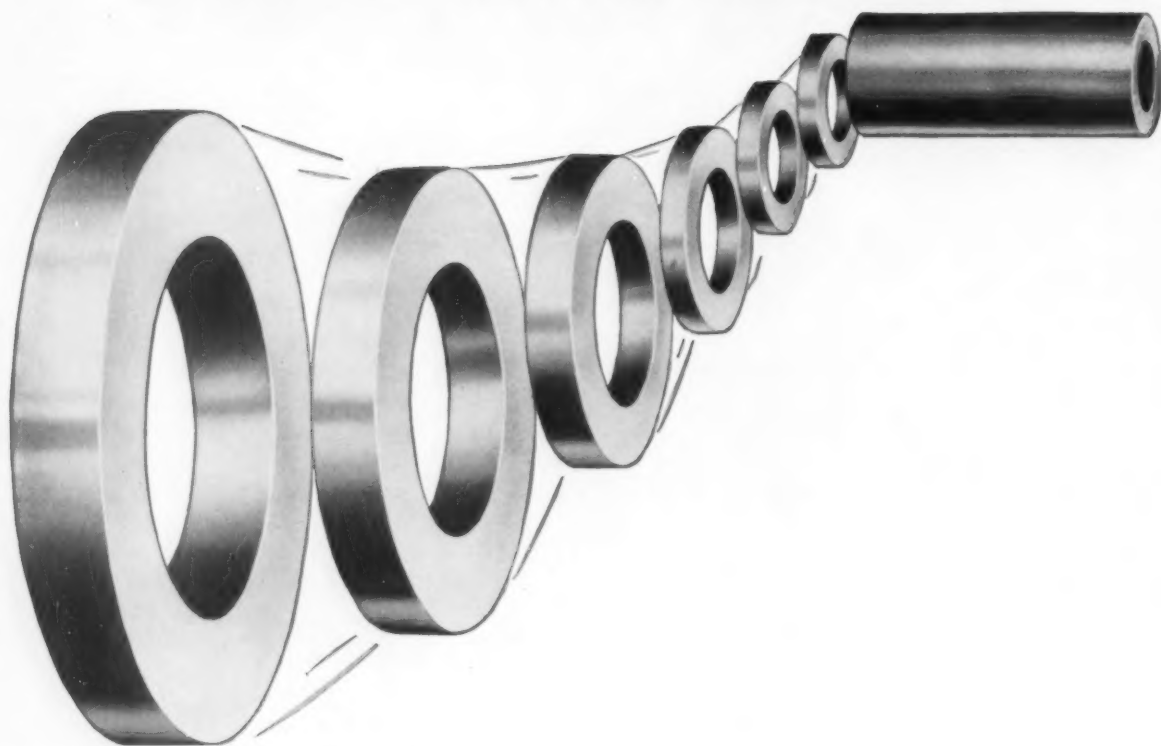
The phone rang. It was a steel company whose engineering space was blocked off by the strike. Could it rent MacGregor drawing boards and send draftsmen over? Jim did some fast thinking. Although flat broke, he said, "No." He wouldn't take any rent; the mill

could use the drawing boards without charge. Next day, the strike was settled. Within a week Jim's goodwill gamble paid off in a contract for engineering a pickling line. Other orders started coming in and the MacGregors were back in business.

In 1951 they decided that if they could engineer steel mill equipment, they could build it. They bought the facilities of Gillespie Manufacturing Co. and took the name, York-Gillespie. First jobs were for small rolls, valves and other replacement parts. Gradually, they worked up into the big bread-and-butter jobs—building blooming mill tables, hot beds, furnace charging machines and others.

The success of Jim and Charles MacGregor has been a story of courage and ability. Both have strong backgrounds in steel mill engineering. Jim has been primarily the outside man, bright, engaging, fast on his feet. Charley has stayed with the technical end. He is quiet, steady, a brilliant engineer and a determined worker.

How to add machining capacity without adding machines



...and save money on your steel!

ARE you making hollow parts, or boring out solid bar stock? Timken® seamless steel tubing can eliminate that unnecessary and costly boring operation—because Timken seamless steel tubing comes with *the hole already there*.

By cutting out this needless operation, you free screw machine stations for other jobs. You get increased machining capacity without adding machines. More than that, you pay only for the steel you use—without wasting solid bar stock centers. And of course you speed up your hollow part operation by starting with Timken seamless steel tubing; *finish* boring can become

your first production step.

Timken seamless steel tubing is made by a piercing process which is basically a forging operation. So you get fine forged quality: uniform spiral grain flow for greater strength, and refined grain structure. This quality is maintained from heat to heat, tube to tube and order to order. The Timken seamless steel tubing recommended by our engineers as *your* most economical tube size will be guaranteed to clean up to your finished dimensions.

The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

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TRADE-MARK REG. U.S. PAT. OFF.

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The Iron Age INTRODUCES

Gordon E. Keim, elected president and general manager, **Philadelphia Bronze & Brass Corp.**, subsidiary of P. R. Mallory & Co., Inc., Indianapolis; **Harold T. Hunter**, elected secretary; **Samuel P. Archino**, elected treasurer.

William M. Smart, appointed vice president, **Union Carbide Nuclear Co.**, Div. of Union Carbide and Carbon Corp., New York.

Dr. G. C. Monture, elected vice president, **Strategic Materials Corp.**, Buffalo, N. Y.

Richard S. Miles, named vice president, operations, Los Angeles plant, **The Coil Plate Sheet Steel Corp.**

Frank P. Strong, named asst. treasurer, **Chase Brass & Copper Co., Inc.**, Waterbury, Conn.

Charles Yutmeyer, appointed superintendent, Steel Works Div., **Crucible Steel Co. of America**, Midland, Pa.; **J. L. Edwards**, named superintendent, Bar Mill Div.; **D. H. E. Genter**, named superintendent, Forge Blank Dept.; **J. E. Holt**, named superintendent, 24 in. Bar Mill Dept.; **A. C. Redding**, appointed superintendent, Cold Drawing and Cold Finishing Depts.; **J. M. Walton**, named asst. to works manager; **R. C. Gilroy**, named chief industrial engineer; **Edward Troutman**, named supervisor, safety.

Russell S. Strickland, appointed vice president, sales, **Federal-Mogul-Bower Bearings, Inc.**, Detroit.

Robert P. Sayers, named manager, **Link-Belt Co.**, Duluth, Minn., district office.

Raymond J. Wilcoxon, named safety supervisor, Berger Div., **Republic Steel Corp.**, Canton, O.

S. L. Jackson, named New York district manager, **Electro Metallurgical Co.**, Div. of Union Carbide and Carbon Corp.

Millard A. Hammond, named manager, welding fittings sales, Tubular Products Div., **The Babcock & Wilcox Co.**, Milwaukee plant.

C. Brooks Ricca, named Philadelphia district sales manager, Pennsalt chemicals' metal processing products, **Pennsylvania Salt Manufacturing Co.**, Philadelphia; **James Carlin**, assigned to field sales staff.

J. Paul Reynolds, named product specialist, vacuum furnace sales and product development, Vacuum Processing Equipment Div., **F. J. Stokes Corp.**, Philadelphia.

James A. Howells, named asst. sales manager, **Wheeling Corrugating Co.**, Chicago branch.



ELMORE H. BROADHURST, named general manager, Cyclops Div., Universal-Cyclops Steel Corp.



HUGH D. CONNELL, named manager, Project Engineering Dept., Acme Steel Co., Chicago.



CHARLES J. STOFKO, appointed general manager, Barnes-Gibson-Raymond Divs., Associated Spring Corp., Plymouth and Ann Arbor, Mich.



GLADSTONE C. HILL, named manager, sales, Indianapolis, Ind., U. S. Steel Corp.

PERSONNEL

Blaz Lucas, Jr., appointed director, procurement, Chicago Works, **Ingersoll Products Div.**, of **Borg-Warner Corp.**

Walter W. Landgraf, appointed production scheduling manager, **Lacled-Christy Co. Div.**, **H. K. Porter Co., Inc.**, St. Louis.

Joseph P. Battaglia, appointed manager, Double Seamer Service Dept., Pacific Div., **National Can Corp.**, Chicago.

Frederick J. Burnett, named manager, alkyd resin product sales, Chemical Materials Dept., **General Electric Co.**, Schenectady, N. Y.

Harold L. Russell, named Eastern regional manager, **Fischer & Porter Co.**, Hatboro, Pa.; **William C. Abbey**, named Southwest regional manager, Houston, Tex.

Thomas E. Snyder, named acting manager, **Detroit Warehouse, Jones & Laughlin Steel Warehouse Div.**; **Clarence J. Pistor**, named asst. manager, **J & L Warehouse**, New Orleans; **William H. Boothe**, named manager, **Lancaster Warehouse**.

Frank E. Halderman, appointed general manager, **Bower Roller Bearing Div.**, **Federal-Mogul-Bower Bearings, Inc.**, Detroit; **William E. Calder**, named executive assistant to general manager.

W. Kenneth Dorman, named asst. manager, slag sales, **U. S. Steel Corp.**

Robert G. White, named application engineer, **Detroit Regional industrial product sales office, Vickers, Inc.**; **Robert G. Harte**, named application engineer, **Summit**, N. J., district sales office.



D. S. CLARK, elected president, **American Society for Metals**.



E. N. HOWER, named manager, **Engineering and Construction Department Sales, Dravo Corp.**, Pittsburgh.



ROBERT B. MENEILLY, named assistant manager, tin plate sales, **U. S. Steel Corp.**, Pittsburgh.



DONALD K. WRIGHT, named assistant manager, tin plate sales, **U. S. Steel Corp.**, Pittsburgh.

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- In hardening gear teeth by carburizing, carbon content and depth of penetration are vitally important. **BRAD FOOTE** insures precise control of these factors through metallurgical tests with equipment developed specifically for this purpose.
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- Add these precise controls to specialized production and heat-treating equipment and a wealth of detailed experience in producing gears of all types—you begin to appreciate why **BRAD FOOTE** can produce better quality gears at substantial savings.
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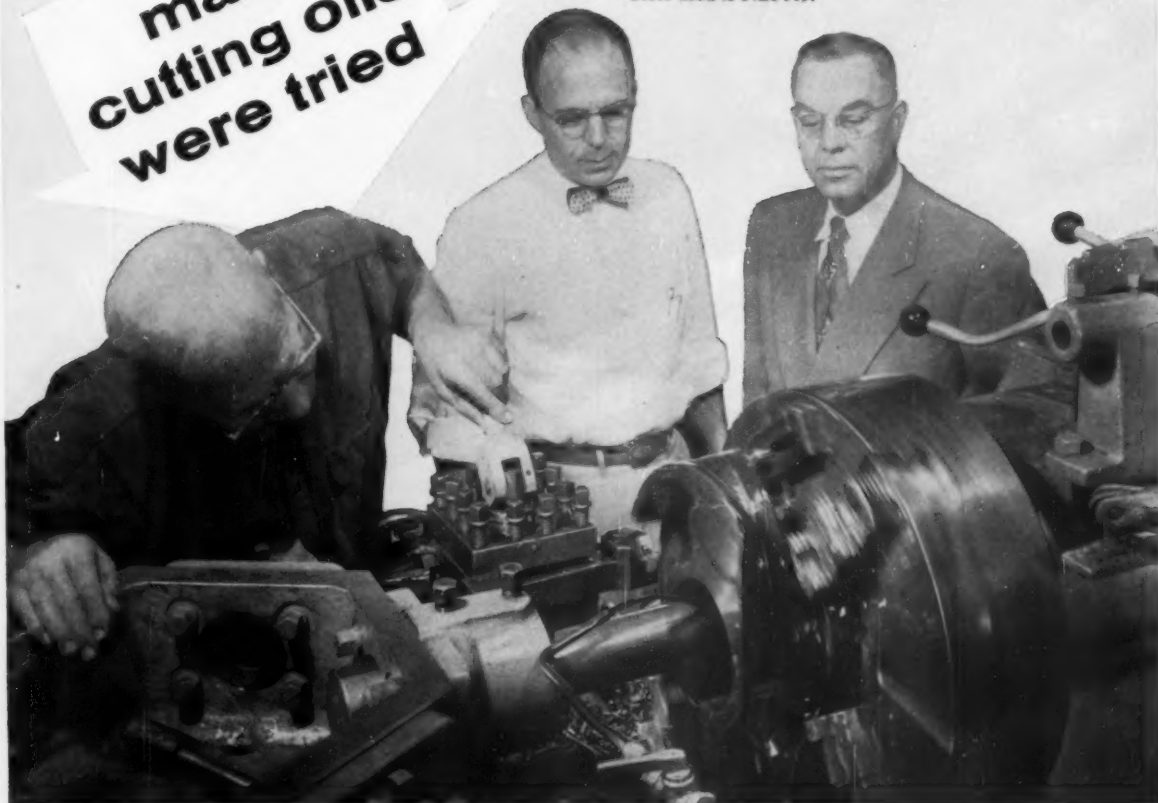
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many
cutting oils
were tried

Mr. J. R. Weidenheimer (center), Plant Superintendent of the Lynch Corporation, and Mr. L. C. Williams (right), Gulf Sales Engineer, check the performance of Gulfcut 21 on an Acme Turret Lathe where a cam is being machined. Steel used is NE8445.



... GULFCUT 21 was chosen

by the Lynch Corporation, Anderson, Indiana

"We did not choose Gulfcut 21 at random," says Mr. J. R. Weidenheimer, Plant Superintendent of the Lynch Corporation, well-known glass machinery manufacturer. "Many different cutting oils were tried but Gulfcut 21 proved best in our tests. We feel that it gives better protection to the tool and contributes to a smoother machining operation."

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One important reason for the outstanding performance of Gulfcut 21 is a special Gulf process

of combining sulfur. This provides greater sulfur activity over the entire range of a cutting operation—gives the tool maximum protection and helps to reduce built-up edge. Gulfcut 21 also has excellent anti-weld characteristics and extreme load carrying ability.

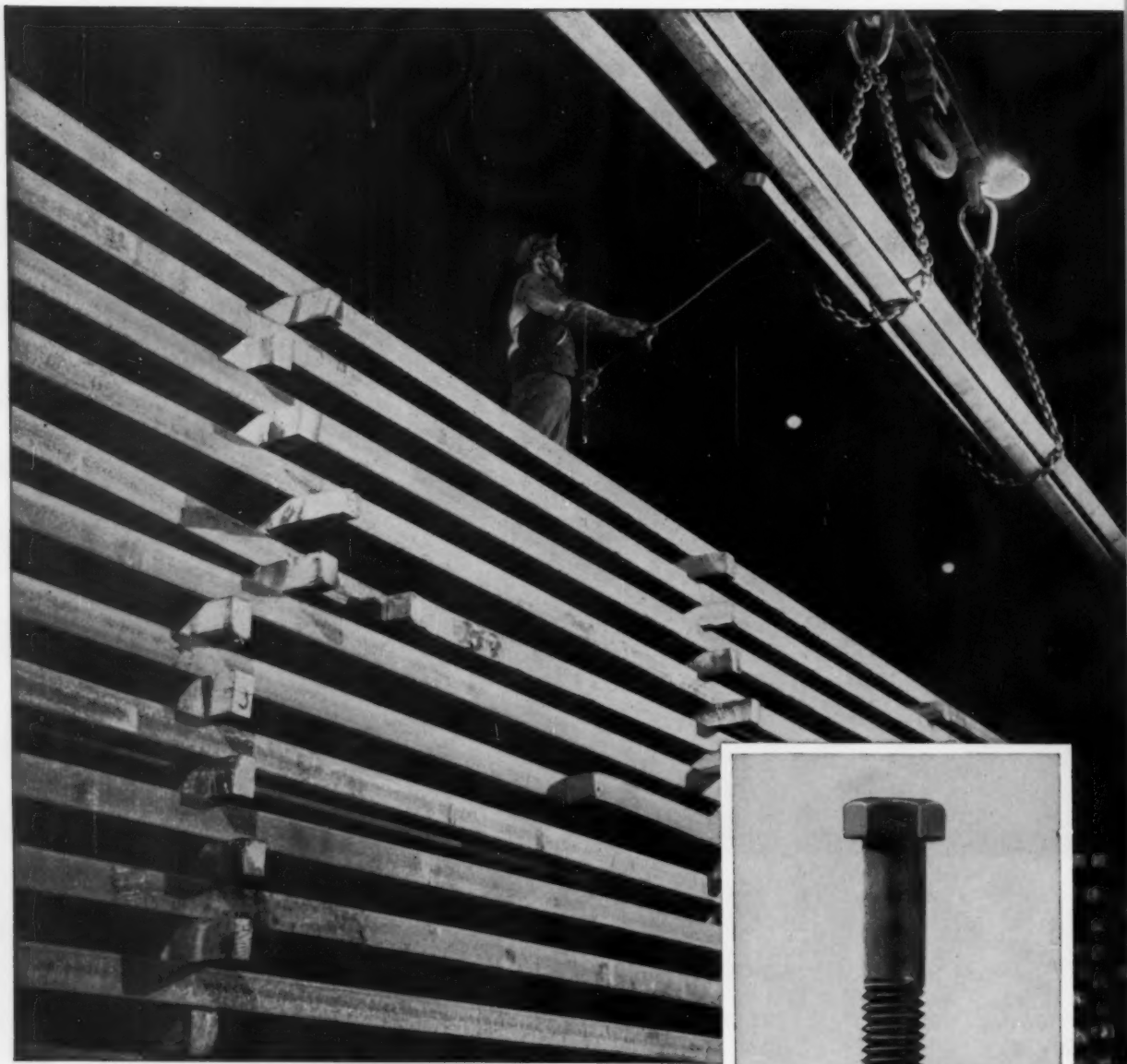
Gulfcut 21 is only one of the complete line of quality GULFCUT oils that will help you get improved production and longer tool life in all your machining operations.

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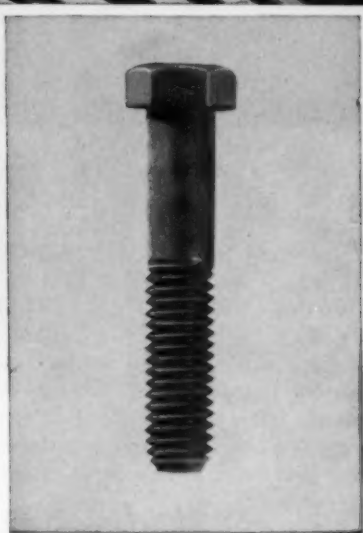


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steel billets delivered to our Bolt and Chain Division. In fact, we make over 50 different analyses of alloy and carbon steels, each one the finest available for the ultimate use of fasteners it will form.

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- PUT THE "test"
IN testing!

The image shows three overlapping forms. The top form is titled 'RESUME OF TESTS Standard Abrasive vs. Malleabrasive' and contains a grid for recording test results. Below it are two 'DAILY Shift Record' forms, which are used for tracking production and testing data over time.

The only real test of any abrasive is its cost per ton of castings—obtained only by completely recorded use in production.

Malleabrasive was the first metal abrasive to be sold on the basis of recorded production performance in user's plants. The fact is, in its early stages of limited production, we sold it only to those who would agree to run recorded comparative tests. Yes, Malleabrasive really "put the test in testing"—really started all of this testing business!

Malleabrasive's economy has since been proven in hundreds of plants, so there are no restrictions on its sale any more. But—we do say, if extravagant claims and gimmick-guarantees are offered you that some other abrasives are cheaper for you than Malleabrasive, the only way to get the facts is to run recorded tests of both materials. Don't depend on generalities.

Samples of the test record forms used to establish Malleabrasive's economy will be sent on request. Write us.

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Sold and recommended by
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"NOW IN EASY TO HANDLE
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PERSONNEL

Richard Reiss and Henry Levesque, named assistant sales managers, **Baird Associates - Atomic Instrument Co.**, Cambridge, Mass.

David E. Neustadt, named vice president and marketing director, **The National Metal Abrasive Co.**, Cleveland.

Arthur L. Goeschel, appointed manager, Santa Rosa plant, **NRC Metals Corp.**

John F. Zubrod, appointed product manager, Air Conditioning Div., **Whirlpool-Seeger Corp.**, St. Joseph, Mich.

Dr. Frank W. Barsalou, named an associate economist, Economics Research Div., **Stanford Research Institute**, Phoenix.

Robert L. Baldwin, appointed sales metallurgist, **Precision Steel Corp.**, Bridgeport, Conn.

J. Walter Kennedy, elected asst. treasurer, **Pennsylvania Engineering Corp.**, New Castle, Pa.

James M. Rooney, named abrasive engineer, **Bay State Abrasive Products Co.**, Westboro, Mass.

Claude E. Weekly, named product service engineer, **Mac Dermid, Inc.**, Waterbury, Conn.

John Wambold, named metallurgical engineer, research staff, **Kennametal Inc.**, Latrobe, Pa.

Francis D. Lordi, appointed development engineer, Foundry Dept., Applied Research and Development Lab., **General Electric Co.**, Schenectady, N. Y.

Ralph R. Ryan, named sales representative, Detroit district, Tubular Products Div., **The Babcock & Wilcox Co.**, Beaver Falls, Pa.

Peter Veit, appointed sales and service engineer, **Enthone, Inc.**, New York.

R. T. Johnstone, appointed assistant sales manager, **The Cross Co.**, Detroit.



This plant's stockpile is worth millions -- yet it doesn't cost a cent !

The "wild blue yonder"—the free and limitless atmosphere—is the stockpile for Air Products Oxygen (and/or Nitrogen) Generators. There are no delivery problems for this inexhaustible raw material. There are no price fluctuations and no shortages to trouble the owners of these plants.

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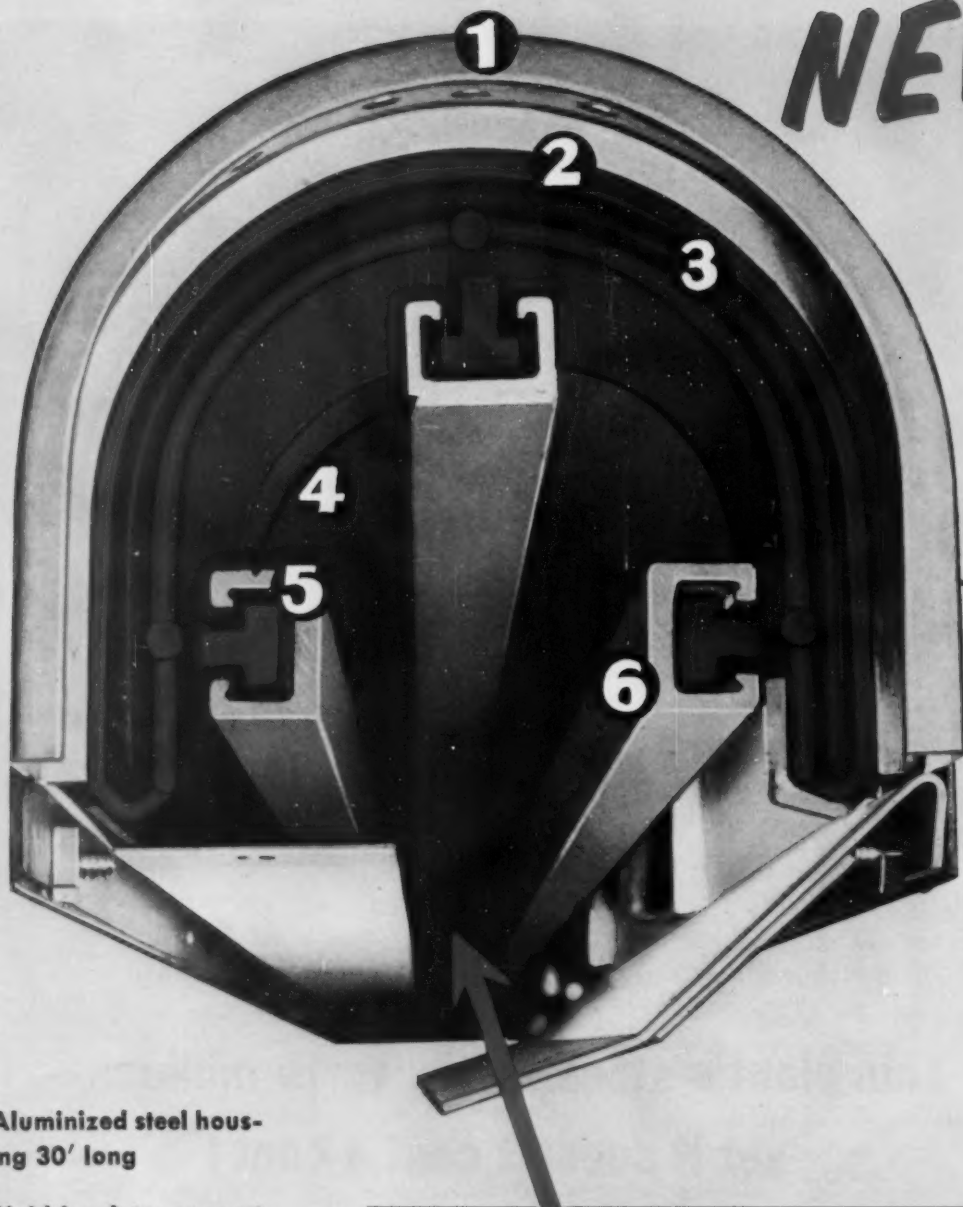
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- ④ Maximum leakage distances
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- ⑥ Current pick-up surface for rugged trolley

"SAFETY-SLOT" COVER FOR MAXIMUM SAFETY

Elbowed trolley arm passes freely along slotted bottom cover but accidental contact with current-carrying members of system is practically impossible. A positive guard for personnel.



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HEAVY-DUTY LIGHTWEIGHT TROLLEY BUSWAY SYSTEM

Fast-action INSTALLATION...

Safety-first POWER

THE NEW LIGHTWEIGHT SYSTEM FOR CRANES, HOISTS, STRAIGHT-RUNWAY EQUIPMENT

SAFE POWER is the cheapest power. The new Keystone LEC-TROL-FEED System wipes out hazards of open systems . . . brings new dependability to tough installations . . . works long and hard without needing attention.

And the system starts paying its board and keep right away. Because of its preassembled units, its lightweight aluminum bus bars, its longer track sections and simple design, it saves you on installation. Write today for complete data.

SAFETY-FIRST with fully enclosed steel housing. Maximum protection against contact with current-carrying bus bars from any direction. Built-in safety lets you locate system where most convenient—indoors or outdoors.

RUGGED to take rough treatment, heavy continuous duty. Corrosion-resistant aluminized steel housing, high-strength aluminum alloy bus bars, petticoat-type insulators, sturdy trolley with massive components for

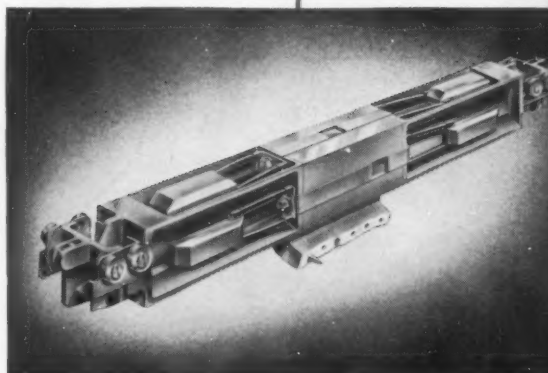
extra severe operating conditions. Most efficient A.C. or D.C. service, greatest phase-to-phase leakage distance with delta conductor arrangement.

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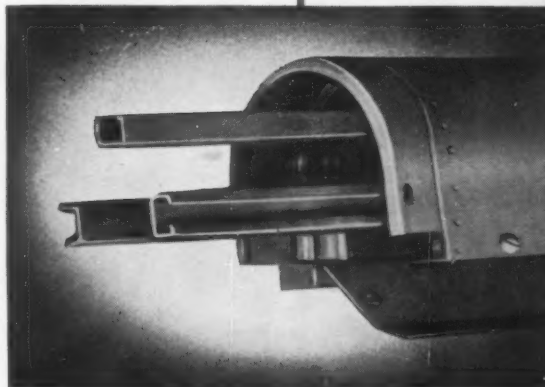
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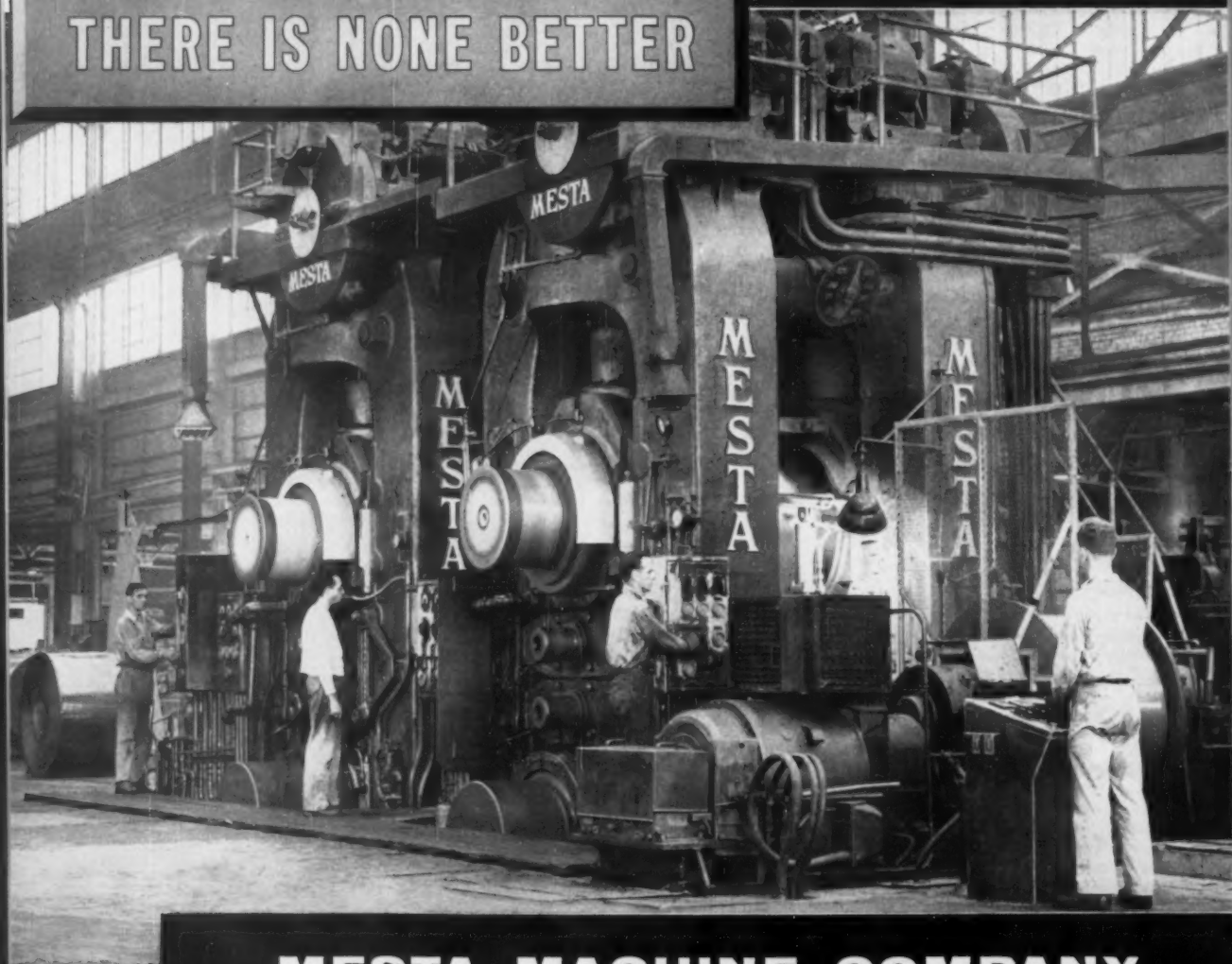
PREASSEMBLED UNITS cut installation time, carefully engineered components make servicing and alterations fast, easy, safe.





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FEATURE ARTICLES

Over-Lubrication Shortens Anti-Friction Bearing Life

♦ Ball and roller bearings function best when the right grade and correct amount of lubricant is applied properly . . . Over-lubrication is a common cause of bearing failure, even more so than using too little oil or grease.

♦ Why use oil for some bearings, grease for others? . . . What qualities should you seek in these lubricants? . . . How do you avoid over- or under-lubrication? . . . When should you replenish oil or grease? . . . Here are the answers.

By E. P. STAHL, Service Dept., Garlock Packing Co., Palmyra, N. Y.

♦ MODERN ball and roller bearings are designed for long, trouble-free performance provided that they are properly maintained and lubricated. Improper lubrication is a major cause of bearing failure, usually because the lubricant was (1) the wrong kind, (2) used in the wrong amount, (3) applied incorrectly.

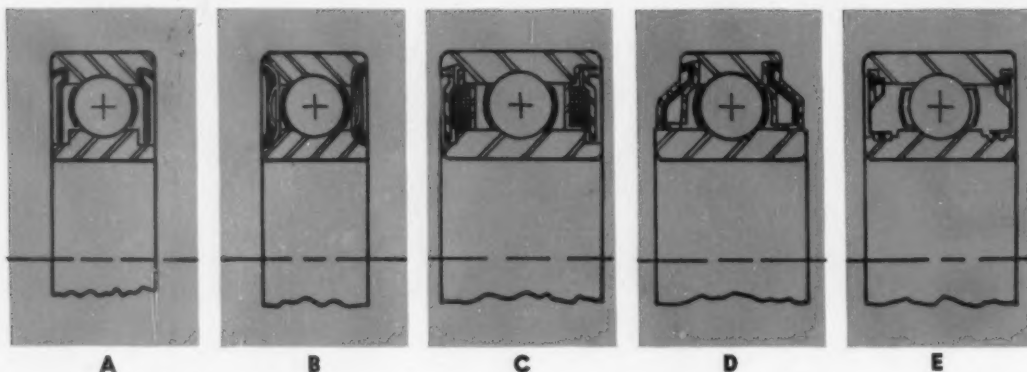
Contrary to a widespread belief, anti-friction bearings require a surprisingly small amount of lubricant for satisfactory operation. Over-lubrication is a common source of trouble, especially where pressure guns are used to force grease into bearing housings. In fact, too much lubricant is more dangerous to bearing life than the obvious hazards of under-lubrication.

Over-lubrication is not only wasteful, but also results in power losses caused by internal friction and excessive wear. As yet, there is

no one device or system to guard against over-lubrication that will be completely effective in all cases, especially where individually-lubricated pillow block bearings are used. Maintenance men, wanting to make certain that such a bearing has enough lubricant, all too often "give it the gun," only to "pack the bearing."

However, this problem has been solved to a large extent by the use of pressure relief fittings on bearing housings. These are simple, economical devices that react, when a specific back pressure is reached, to pass excess grease through escape parts. They make it impossible to "pack" bearings; as little as 0.01 oz of excess grease will show up at the escape ports. Furthermore, presence of escaping grease is proof that undetected air pockets in the grease

| TABLE I | | WEEKS BETWEEN GREASINGS FOR BALL AND ROLLER BEARINGS | | | | | | |
|---|------------------------|--|---------|----------|-----------|-----------|-----------|-----------|
| Bearing Operation (hours per day) | Revolutions per Minute | | | | | | | |
| | 1-250 | 250-500 | 500-750 | 750-1000 | 1000-1500 | 1500-2000 | 2000-2500 | 2500-3000 |
| 8 | 12 | 12 | 10 | 7 | 5 | 4 | 3 | 2 |
| 16 | 12 | 7 | 5 | 4 | 2 | 2 | 1 | 1 |
| 24 | 10 | 5 | 3 | 2 | 1 | 1 | 1 | 1 |



CLOSURES for self-sealed bearings are made of metal, synthetic rubber or felt, are applied to standard-width bearings (A and B), to overwide

rings or races (C and E) or to those with a standard width outer ring and a wide inner ring (D) They keep dirt out, lubricant in.

gun have not resulted in under-lubrication.

Where machines are equipped with self-sealed or so-called "sealed-for-life" bearings, the best maintenance treatment is to forget that the bearings are there. These anti-friction units are packed with a measured amount of high grade bearing grease at the manufacturer's plant. They are particularly desirable for use in out of the way locations on machinery—places where lubrication might either be done carelessly or not at all.

Original decision by the machine designer on the use of oil or grease in anti-friction bearings is based on detailed studies of bearing size and type, housing design, seals and closures, and other factors. Equipment manufacturers usually recommend grease for effectively-sealed bearings operating up to 4000 rpm. Grease does not tend to work out of housings as readily as oil. It is relatively easy to apply and in some cases helps to seal the housing at the shaft opening. However, the prime

function of grease is to lubricate, not seal.

Principal thing to look for in a suitable grease for ball or roller bearings is consistency. In this respect, the No. 2 or No. 3 SAE grades are acceptable. Greases of this consistency are stiff enough so that they will not churn at high speeds, yet soft enough so they will not dry out.

Absence of solids helps

Another desirable characteristic in anti-friction bearing grease is the absence of solids such as talc, graphite or ground pumice. These materials act as abrasives whenever the oils in the grease evaporate. Moreover, only mineral base greases (soda soap or lime soap) should be used; not vegetable or animal grades. The lime-soap variety is preferable only where a non-soluble grease is required. The soda-base type is a somewhat better all-purpose lubricant.

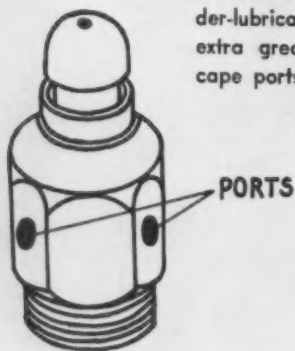
For maximum efficiency, level of grease in the bearing housing should cover only the bottom third of the lowest ball or roller. If the housing is too full, there is a tendency for the grease to churn and produce heat from internal friction.

Where bearing speed is above 4000 rpm, and where high temperatures prevail, oil is the preferred lubricant. Vegetable and animal oils are not recommended for use with ball or roller bearings because they are apt to gum up, or else become rancid and develop an acid which corrodes bearings and shortens their life materially. Only a pure mineral oil of an SAE 30 or 40 grade should be used.

Oil level in a bearing housing should never be above the center of the lowest ball or roller. Supply of the lubricant is generally maintained by either a splash, circulating or mist system.

Oil mist systems are used quite successfully on high speed machinery such as grinders. In these units, compressed air is filtered before

PRESSURE-relief type of grease fitting avoids both over-lubrication and under-lubrication by passing extra grease out of escape ports.



it passes into the venturi section of a lubricator bowl. Air movement inside the bowl creates a suction at the oil inlet. Thus oil is drawn up through a siphon tube, and flows continuously into a "sight-feed" dome.

At this point, air moving through a venturi in the dome breaks up the oil stream into fog particles of varying size. As the fog passes through the upper section of the reservoir, heavy particles drop out of the air stream and return to the oil supply. Only a very finely dispersed fog leaves the lubricator unit through the discharge port. Individual fog particles measure two microns or less in diameter as they enter the bearing housing.

In some bearing applications air flow of the mist system is increased to aid in excluding dirt from the rolling parts, or help cooling.

As with the pressure-relief grease fitting mentioned previously, the oil-fog lubricating system also prevents over-lubrication and consequent heating of bearings.

Most high-speed bearing applications re-

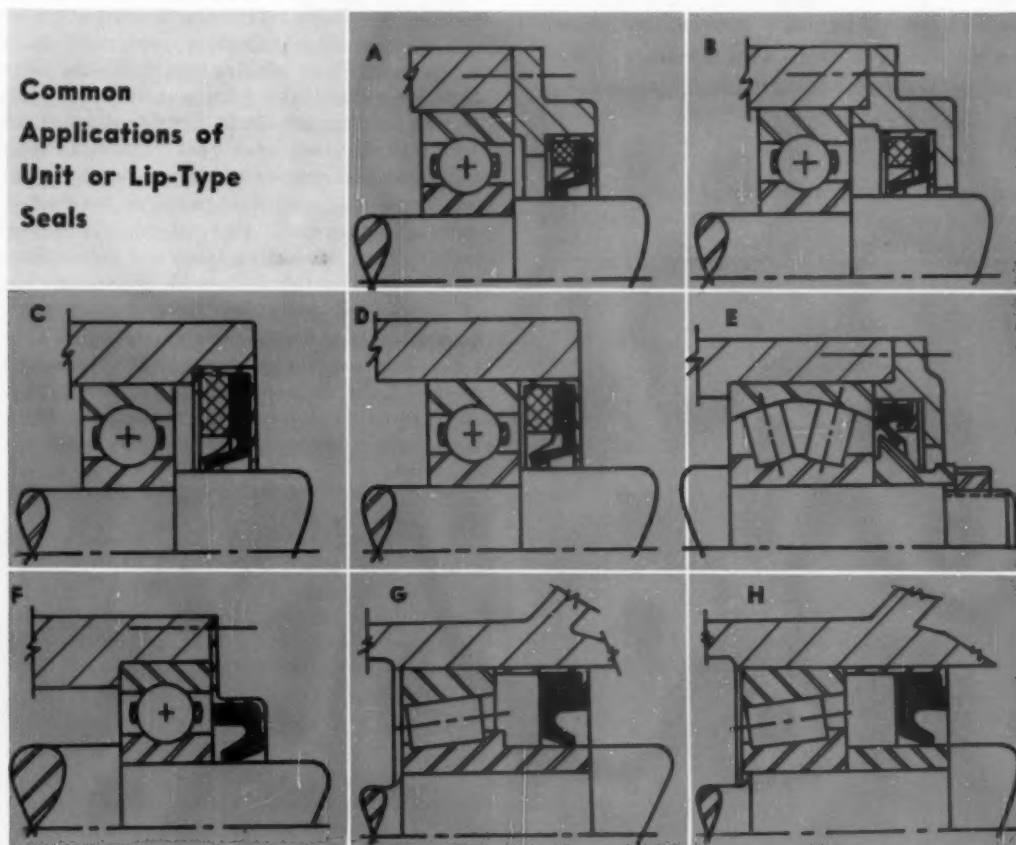
quire oil because conventional greases tend to break down and separate. Result of such a breakdown is an oil component which can leak out or evaporate, plus a caked and hardened residue which the bearing must push out of the way. However, there are exceptions to this general rule; special greases have been developed to operate at super high speeds in such applications as grinding machine spindles.

There is no ironclad rule to be followed regarding the frequency with which ball-and-roller-bearing-equipped machines should be re-lubricated. Proper times for replenishing oil or grease will vary with service conditions.

However, it is safe to say that oil levels generally need attention as often as twice a month, or even more frequently, in some cases. And as a general rule, grease requires renewal only once a month, or less.

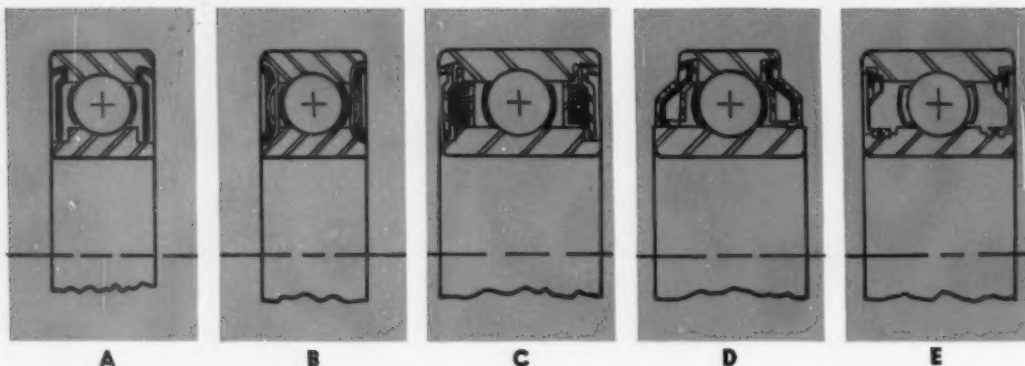
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Common Applications of Unit or Lip-Type Seals



- (A) Spring loaded seal in unprotected end cover.
- (B) Spring loaded seal in protected end cover.
- (C) Seal press-fitted into housing counterbore.
- (D) Economically press-fitted into bearing bore.

- (E) Tangential seal for self-aligning rollers.
- (F) Flange type seal with ball bearing.
- (G) Seal pressed against tapered bearing cup.
- (H) Seal on spacer between cone and shoulder.



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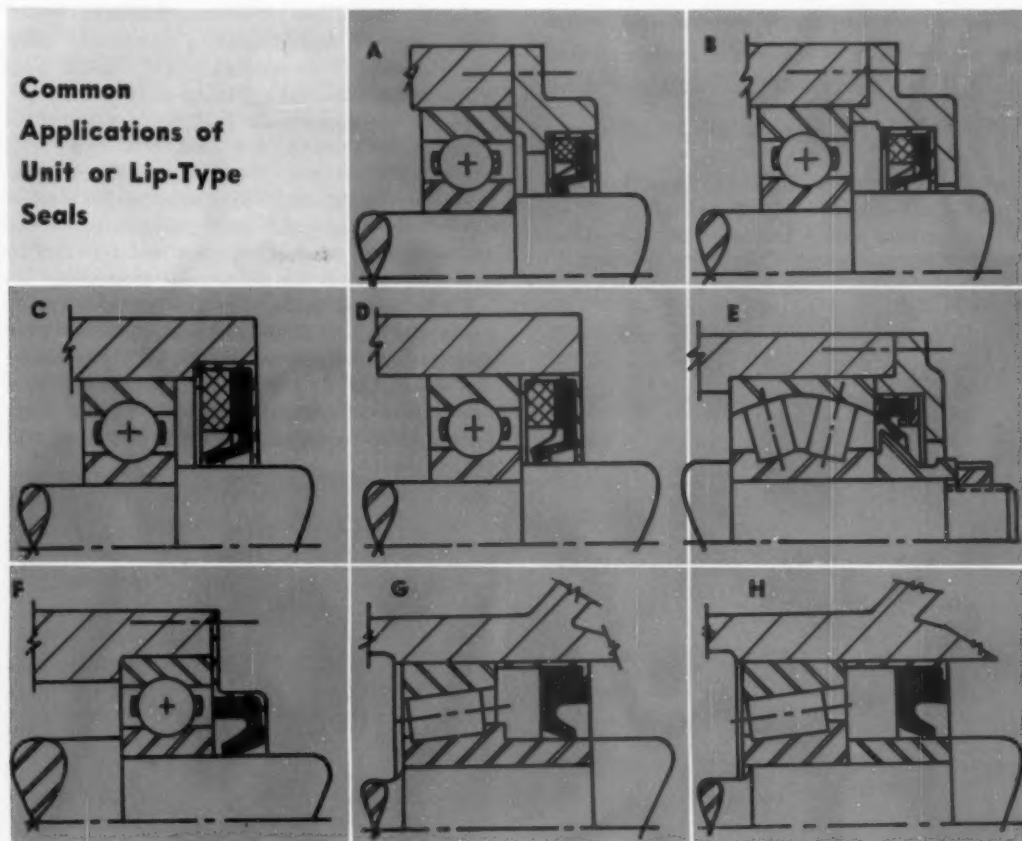
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- (C) Seal press-fitted into housing counterbore.
- (D) Economically press-fitted into bearing bore.

- (E) Tangential seal for self-aligning rollers.
- (F) Flange type seal with ball bearing.
- (G) Seal pressed against tapered bearing cup.
- (H) Seal on spacer between cone and shoulder.

New Flash Welder Trims Flash As It Welds

♦ Postweld cost for machining, grinding or chiseling flash from joints can often run more than that of the weld itself . . . Such cost factors have held back flash-butt welding from its natural place as a fast, reliable joining method.

♦ One flash welder eliminates the need for separate flash removal by simply trimming upset metal from the workpiece as the weld is made . . . Precision dies shear weld metal flush and largely avoid further cleaning or finishing.

♦ POSTWELD cleaning and finishing costs can often exceed the cost of the weld itself. These costs assume particular significance when removal of weld slag or weld flash enters the picture, as is the case with the metal arc or flash welding processes. Some production people consider postweld costs a major barrier to wider use of an essentially low cost joining method: flash-butt resistance welding.

If separate flash trimming operations could be eliminated, flash welding might become more attractive to many as a joining method.

A new development for flash welders, called the Synchro-Shear, achieves just this end. The equipment automatically shears flash, even from hardenable steel workpieces, as the weld is made. At the same time, it maintains the desirably high production rates and fast cycling that characterize the flash welding process.

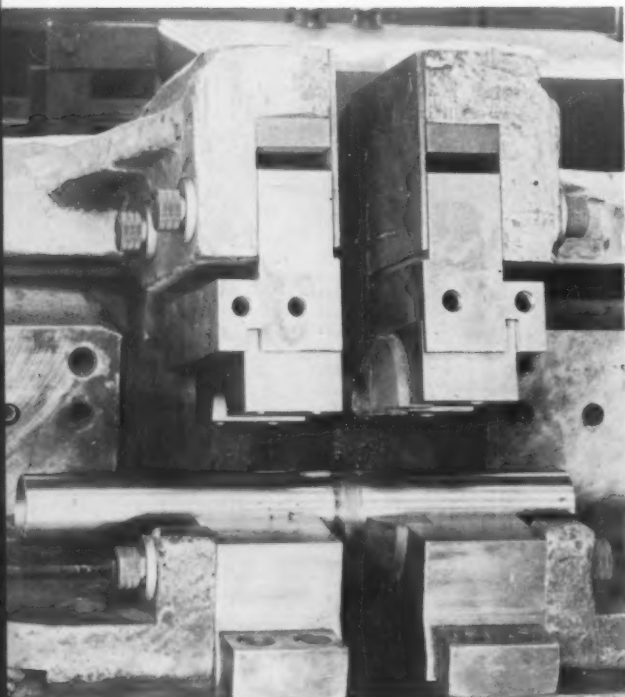
Flash welded parts can now move in many cases directly to final assembly stations. This is possible because of the smoothly sheared surface of the flash welded joint. Unless part drawings call out special finishes on the overall workpiece, postweld cleaning may similarly be avoided.

Welds, trims alloy steels

The equipment first welds, then trims resulting flash from workpieces both of similar and dissimilar metals. According to the builder, Thomson Electric Welder Co., Lynn, Mass., these metals include the stainless steels, high alloy steels, high speed steels, and steels containing up to 1 pct carbon. Another Thomson development employing pinch-off dies is generally used on such softer metals as copper and aluminum.

The machine handles most workpiece shapes normal to flash welding: flats, squares, rectangles, rounds, and most irregular or extruded shapes.

Dual functioning of the flash welder explains how it can cut production costs associated with flash welding. At precisely the right moment in the weld cycle, dies advance to shear the still plastic flash from the workpiece.



SHEARING dies nest in moving jaws (r), that also provide pushup pressure to weld workpiece.

Need for separate flash trimming operations is thus avoided. Attendant costs for labor and equipment are eliminated. Special flash trimming equipment, if used earlier, is required no longer. Slow and costly machining, grinding, chiseling or other means of removing upset metal generally need not be continued.

Ready for assembly

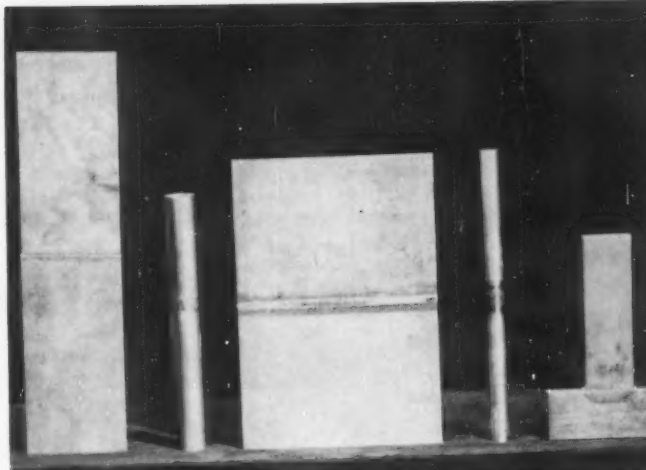
Dies shave off flash and upset almost entirely. For most purposes, workpieces are ready for use as they come from the welder. Only highly finished products need further finishing. Even then, the weld area requires no more attention than is conventionally given the remainder of the workpiece.

Time saved by eliminating separate flash trimming operations is for all practical purposes a total gain. Production rates do not appreciably differ from those of conventional flash welders, in which flash must later be sheared.

Shearing action is initiated automatically as an integral part of the flash weld cycle. The exact moment at which trimming takes place may be adjusted to suit the individual conditions. Timing of the shearing action is of particular importance. The material must be sufficiently soft to permit cutting, but hard enough to prevent dragging.

Essentially standard, vertically-mounted jaws clamp the workpiece in welding position. Shearing dies recess into moving jaws, and shear as pushup pressure is applied. Dies are hardened tool steel.

The flash welder itself functions much as do other machines built to standards of Resistance Welder Manufacturers Association. Shearing dies and associated equipment form only a small portion of the equipment's total cost. This means simple calculation of equipment

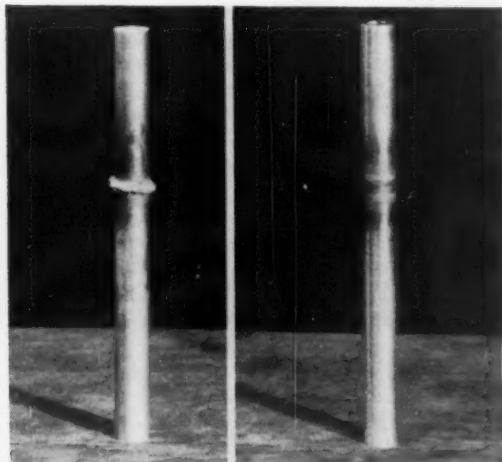


TYPICAL of work flash welded and trimmed (l to r): 0.65 pct carbon steel bandsaw stock, 0.070 in. thick; cold rolled tubing, 1 1/4 in. OD; 18-8 stainless steel, 1/8 in. thick by 8 in. wide; M2 HSS joined to medium carbon drill stock; T-weld in 3/8 in. thick hot rolled, high carbon steel.

and labor costs now associated with trimming of flash will give a fair approximation of savings to be anticipated with use of such equipment.

In a typical operating sequence, workpieces are manually loaded. On pressing the sequence button, the flash welding action begins. Equipment then proceeds automatically into the upset, which completes the weld. During this stage, flash is produced. Shearing dies also operate at this point. Required upset force may be somewhat in excess of that found in normal flash welding practice.

After shearing, jaws then automatically release to permit removal of workpiece.



NO more trouble with removal of flash, like at left. Flash-butt welder joins, shears flash at same time.



FLASH WELDER automatically welds flat plate, shears flash flush with workpiece surface.

Prevent those accidents—

Is Your Machine Shop



to Work In



♦ To avoid all sorts of misfortunes, including expensive lawsuits, a sound safety program is worth many times its cost . . . You don't need a magic formula . . . Ordinary common sense will eliminate most hazards to life and limb.

♦ Simplest safety device of all is good planning . . . Apply it first to shop neatness, working space, lighting and ventilation . . . Then move in on more specific threats to the well-being of workers, visitors.

By L. E. JOHNSTON, Instructor,
Mechanical Engineering Dept.,
University of Wisconsin,
Madison, Wis.



Photo by National Safety Council.

COVERED metal containers are a must for disposing of oily rags, other waste material.

♦ SAFETY is one of those things we're often unaware of until we have to dig down deep and pay for the lack of it. It's the old story of not missing the water until the well runs dry.

Too often the need for a safety program doesn't strike us until a visitor or an employee stumbles over a piece of stock, breaks his arm or his pride, and makes a bee-line for the nearest law office.

Lawsuits cost plenty these days—win or lose. An effective safety program for both visitors and employees is cheaper, more profitable and less bother for everyone. All it takes is common sense. With this fact in mind, a walk through almost any machine shop will suggest the beginnings of a usable safety program.

The area where visitors enter and leave is a good place to start. Cracks, holes and ridges in sidewalks or driveways may seem small in comparison to other hazards, but they constitute a positive danger. Cost of eliminating them is negligible, and the chance of accident is greatly reduced.

Entryways, too, are often veritable obstacle courses—full of coat racks, loose floor mats, boxes of parts, miscellaneous supplies and hard-to-operate doors. Again, these are small things, but easily corrected by anyone who will take the time to do so.

Once inside the shop, visitors often find many



Photo by National Safety Council.

EVEN the warning sign may not be enough to prevent a fall, perhaps fire, in the areaway.

signs of carelessness to plague them: greasy floors, air hoses stretched across aisles, tools scattered about. A single pool of oil on the floor can cause a man to slip and injure himself for life. None of these hazards should be allowed in areas where visitors can normally be expected.

Visitors are important, but employee safety is a big item, too. Most employers view this as a personal responsibility to their workers. In addition, the safe machine shop is apt to be more profitable; time lost due to unsafe working conditions is costly, leads to upset routines and

confusion, as well as poor employee morale.

For all its advantages, a safe operation isn't costly to install or maintain. And the simplest safety device of all is the most obvious—organization. A shop organized for cleanliness, adequate working space, good ventilation and good lighting, is well on the way to an excellent safety record.

But good organization is only the beginning. There are a number of basic points that also apply to either the smallest one-room shop or the biggest mass-production plant.

Workers must cooperate

For example, most modern industrial machines are built with safety in mind. But employees will often remove safety devices rather than work around them. This may gain a few seconds per hour, but it's not worth the risk. Safety guards should be left in place and used religiously, even if it must be done under threat of disciplinary action.

Indicator lights to show when equipment is turned on are safety devices, too, designed to prevent burns, injury or shock. Burned-out lamps are easy to ignore, but they are just as easy to replace if a stock is kept on hand.

A dull screwdriver that is too large or too small can throw a man off balance or gouge his hand. Dull and worn drills, cutting tools, wrenches and improvised items cause many accidents. They also produce slipshod work and the inevitable higher costs that accompany poor quality. Common sense safety insists that all workers have the proper tools for all jobs.

All employees have the right to be able to see what they are being asked to do. Poor lighting produces eyestrain, fatigue, substandard work, accidents and absenteeism. Good lighting pays dividends in safety and economy. Engineers from the local utility company will be glad to help with this problem, and the service and advice is free.

Fresh air is a basic human need, and an adequate fan system is worth its weight in gold. Heat, smoke, oil vapors and dust are uncomfortable and unhealthy—cause carelessness, ab-

Benefits of a Safe Shop

| | |
|-------------------------------|--|
| BETTER MORALE— | Employees appreciate clean, pleasant, safe surroundings. |
| BETTER WORK— | A well organized, safe shop attracts top-notch personnel. |
| LESS TIME LOST— | A man absent due to accident or illness can't earn anything for himself or his employer. |
| LESS CHANCE OF LOSS— | A fire or shutdown resulting from unsafe practices can bankrupt a business. |
| LOWER INSURANCE RATES— | For both property and workmen's compensation. |

senteism and high turnover—often for the lack of a few well-placed exhaust fans. The nearest ventilating equipment dealer will gladly recommend proper fan types and point out how they may be used to best advantage.

A machine shop fire is a hazard to guard against at any cost. And a supply of extinguishers doesn't constitute a complete fire safety program, although it is a good start. Most shop fires result from bad smoking habits, oil puddles on floors, use of inflammable cleaning solvents, antiquated heating plants, unsafe wiring and general carelessness.

All of these things can be controlled. Smoking can be prohibited in dangerous areas; containers can be provided for disposal of inflammable waste; non-burning solvents can be supplied; a modern heating system can be installed; outdated wiring can be replaced.

Poor wiring can cause more than inconvenience or a disastrous fire; it can kill with an electric shock. Cost of adequate wiring will be repaid many times over in safety and efficiency. Heavy duty circuits and plenty of outlets with grounding plugs make electrical equipment safer and easier to use.

Voltage at all outlets should be marked plainly. A 120v drill plugged into a 240v outlet can be



Photo by National Safety Council.

STURDY racks for orderly storage of materials are a basic need in good safety programs.

extremely dangerous to the operator, and it won't do the drill much good, either. All switches, receptacles and fixtures should be of the heavy duty type to withstand hard wear. Drop cords should be of No. 10 or No. 12 heavy-duty, rubber-covered cord, insulated at both ends from direct contact with metal.

Shop storage bins can be safety hazards, too, if they are not sturdy and easily accessible. Storing tools or material on makeshift shelves and

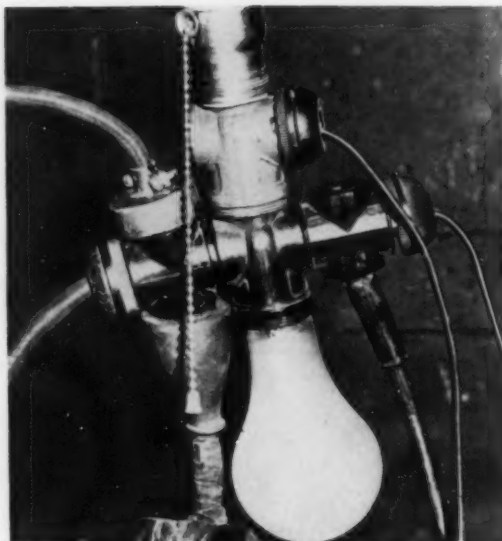


Photo by National Safety Council.

UNSAFE wiring conditions are an open invitation to electric shocks, dangerous fires.

racks is just asking for the whole works to tip over on someone. A well-designed storage area made from sturdy, inexpensive shelf and framing materials is money in the bank. And employees can be taught to keep things in order.

Where welding is done, give all equipment special care and provide plenty of room to avoid injury from hot sparks and metal particles. Keep goggles, helmet and gloves handy for welders, and make their use mandatory. Shield arc welding operations from the eyes of other employees and visitors. Make one person responsible for keeping tanks of gas turned off when not in use.

No one would think of carrying a heavy casting with a watch chain. But many employees still carry loads that are too heavy for them. This produces harmful physical strain, and the obvious danger of loss or damage if the worker drops whatever he is carrying. These hazards can be eliminated by careful planning, perhaps by the purchase of a cart or two. For heavy lifting, overhead hoists or well-placed conveyors will soon repay their cost just in time saved.

It's important to keep loading docks in a safe condition, also. Packing crates can topple over rounded dock edges and broken bones can result from loose and rotted flooring.

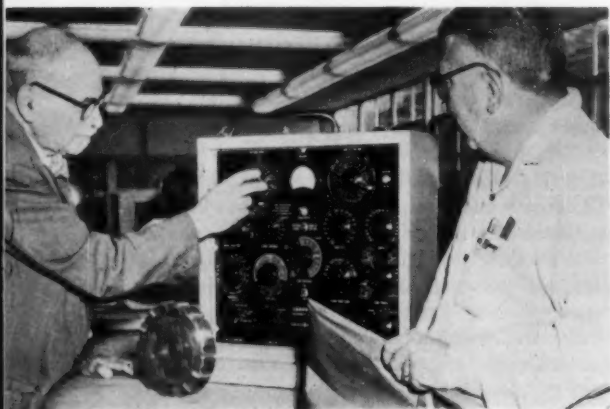
All in all, guard against danger wherever it presents itself. Provide safety devices and procedures wherever feasible, and enforce their use. The fact remains that a safety program is only as good as the authority who sees that it is carried out.

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Computer Sets Up Machining Standards While-You-Wait

♦ **SETTING UP** proper machining standards in many plants is a long-drawn-out procedure, involving operator skill and hours of painstaking tabulations based on past work. In job shop operations, particularly, machining standards can constitute a real headache, because of the many types of jobs involved.

Standards pose problems for tool producers as well. Selling new or newly-designed tools to customers gets to be almost as drawn-out a procedure as actually setting standards, since many customers have little experience on which to base their expectations of probable new-tool performance.



TYPICAL MACHINING PROBLEM is worked out for customer on machinability computer. First step is setting up known conditions of the job.

The O. K. Tool Co., Inc., a national carbide and high-speed steel tool manufacturer, uses a new twist to get around this time lag.

To beat it, and supply customers with fast engineering service in machining operations, the Milford, N. H., firm recently equipped its headquarters with a new Carboloy machinability computer. When fed the necessary basic information it requires, the computer virtually sets up machining standards for the customer on request. Answers are based on years of laboratory and practical research, capsulized into the instrument's circuitry.

Here's how the new service works. The tool company first sends out a prepared questionnaire-type form to its customers. They, in turn, fill in the forms with the information they have concerning the machining job. Forms are then sent back to the manufacturer.

Computer supplies answers

Next step is feeding this information to the machinability computer. The toolmaker is then able to immediately supply the customer with the proper information on speeds, feeds, depths of cuts, tool life, and rates of metal removal recommended within the horsepowers available on the machines.

The computer can be used to figure answers for using complex as well as single-point cutting tools, the firm says. These would include milling and slotting cutters as well as shell and face mills, alternate angle, staggered-tooth cutters and planer tools.

Better strength, ductility—

Vacuum Melting Improves Properties Of New Alloy

◆ VACUUM MELTING has recently picked up considerably in importance in making new aluminum- and titanium-bearing high-temperature alloys. These exhibit markedly superior high-temperature properties when vacuum-melted rather than air-melted.

At the same time, vacuum melting has permitted closer control over composition of other alloys, resulting in improved properties for a variety of difficult-service conditions.

Result has been a steadily increasing demand for vacuum-melted products. Typical of firms stepping up vacuum-melting capacity to keep in

step is Haynes Stellite Co. New facilities recently announced by this division of Union Carbon & Carbide Corp., and now in full operation, have boosted the plant's vacuum-melting capacity by three to four times.

New facilities consist of two 1000 lb furnaces. They'll be used primarily for the production of a new high-temperature alloy, Hastelloy alloy R-235, and for other alloys containing nickel, chromium, titanium and aluminum.

In vacuum melting, an alloy is melted and refined in a closed shell and under a vacuum of less than 50 microns pressure. This method is especially effective for producing precipitation-hardening alloys like Hastelloy R-235.

Reason is that, in this type alloy, both aluminum and titanium are used as important alloying elements. Both oxidize readily in air. To get them into the alloy most effectively as elements, without having them burn into refractory oxides, it's necessary to add them to the molten alloy under a vacuum.

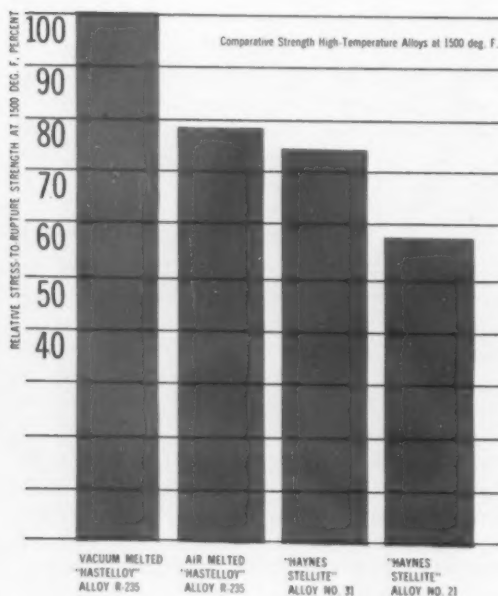
There are other advantages to melting this type alloy under a vacuum. One is elimination of trace elements such as lead, tin, antimony and bismuth, which can get into an alloy as impurities from raw materials.

Under a vacuum, these trace elements become volatile and boil off. Still another advantage, of course, is that undesirable gases such as hydrogen, oxygen and nitrogen are removed, thus preventing formation of harmful oxides and nitrides, which might lead to such objectionable conditions as stringers or inclusions.

For these reasons and possibly others not yet known, vacuum-melted alloy R-235 has shown superior high-temperature properties over the air-melted product. These properties include an average room temperature ultimate tensile

◆ Vacuum melting is winning new friends because of its ability to improve the heat- and corrosion-resistance in the newer aluminum- and titanium-bearing alloys . . . One such alloy is Hastelloy R-235.

◆ Superior properties imparted to this alloy include 20 pct higher stress-to-rupture for 100 hours at 1500°F and better impact strength . . . To benefit by these advantages, Haynes Stellite Co. has boosted its vacuum capacity threefold.



Comparison of Penetration Rates on Hastelloy Alloy F Using Boiling 65 Pct Nitric Acid

| | Penetration Rate, inches per year | | | | | |
|--------------------|-----------------------------------|-------------|----------------|-------------|---|-------------|
| | Unwelded | | Heliarc Welded | | Welded and Stress-Relieved 8 Hours at 1000°F | |
| | Air-Melt | Vacuum-Melt | Air-Melt | Vacuum-Melt | Air-Melt | Vacuum-Melt |
| 1st 48-hour period | 0.017 | 0.012 | 0.020 | 0.012 | 0.016 | 0.009 |
| 2nd 48-hour period | 0.018 | 0.009 | 0.028 | 0.009 | 0.029 | 0.009 |
| 3rd 48-hour period | 0.026 | 0.009 | 0.037 | 0.011 | 0.040 | 0.011 |
| 4th 48-hour period | 0.033 | 0.010 | 0.044 | 0.011 | 0.048 | 0.011 |
| 5th 48-hour period | 0.038 | 0.010 | 0.050 | 0.011 | 0.057 | 0.011 |
| Average | 0.026 | 0.010 | 0.036 | 0.011 | 0.038 | 0.010 |

strength of 167,000 psi and a yield strength on the order of 100,000 psi in the form of mill-annealed bar stock. Strength and ductility remain relatively high up to 1750°F.

At elevated temperatures advantages of vacuum-melting are pronounced.

The chart (opposite page) shows relative strength of vacuum melted Hastelloy alloy R-235, as against air-melted alloy R-235, Haynes Stellite alloy #31 and Haynes Stellite alloy #21. As indicated, stress-to-rupture for 100 hours at 1500°F is 20 pct higher for vacuum-melted alloy R-235 than for the air-melted version of the same alloy. It is 25 pct higher than for the next alloy, Haynes Stellite #31.

This strength superiority drops off at about 1750°F, where cast cobalt-base alloys have superior properties. The drop-off in strength is accompanied by an increase in ductility, however, making R-235 remarkably easy to forge.

Strength is outstanding

Strength of this alloy up to 1750°F is outstanding. Typical average stress-to-rupture in 100 hours at 1500°F is 38,000 psi for bar stock and about 37,000 psi for sheet. The alloy also shows good impact strength. Solution-annealed bar has an average Charpy V-notch impact strength of 107 ft/lb at room temperature.

An example of an alloy which will be vacuum-melted at Haynes Stellite primarily to provide a closer control over composition is Hastelloy alloy F. In this case, carbon's the important element. Reducing the carbon content to below 0.02 pct materially increases corrosion-resistance of this alloy under certain conditions.

The accompanying table shows some comparative penetration rates for production heats of air melted and vacuum-melted Hastelloy alloy F. Tests were made in boiling 65 pct nitric acid

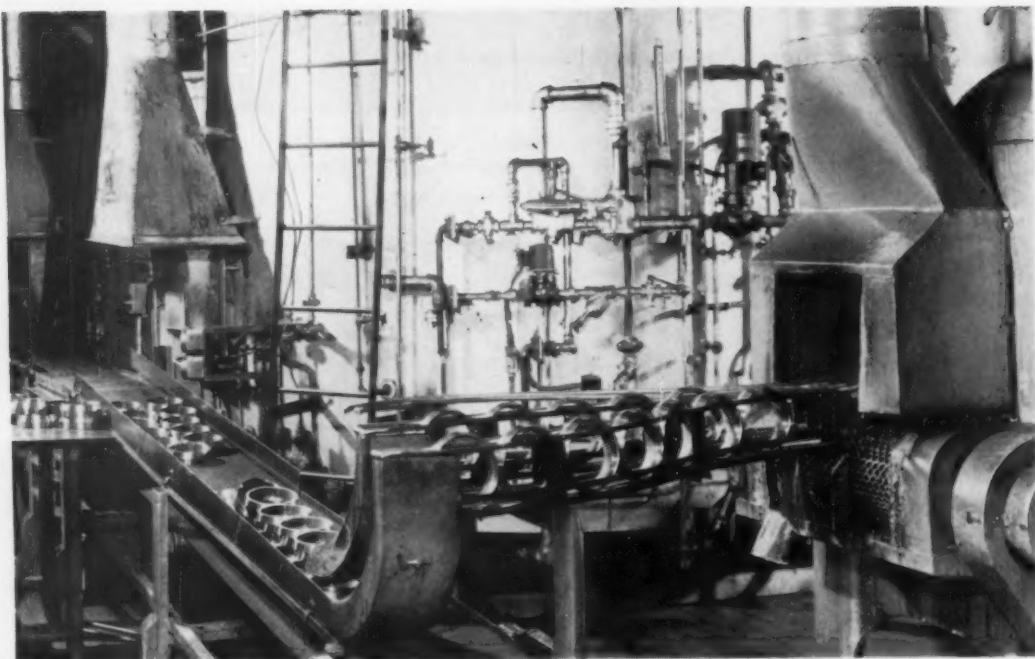
in five 48-hour periods, the standard production quality control test for all heats of this alloy.

As the table demonstrates, average penetration of the vacuum-melted alloy is less than one-half that of the air-melted alloy in the unwelded condition.

Welded specimens of the vacuum-melted alloy showed less than one-third the average penetration of air-melted specimens in the same test. Tests made on welded and stress-relieved alloy F, both air- and vacuum-melted, showed the vacuum-melted alloy to have an average penetration about one-fourth that of the air-melt.



ENTIRE PRODUCTION cycle in this 1000 lb vacuum-melting furnace is carried on with door closed. Operator watches melt's progress through ports.



GEARS LEAVING washer ovens (right) feed to stop-and-go belt conveyor, accumulate there in batches before moving on to furnace line.

Handle with care—

Better Handling Spurs Gear Hardening Production

♦ Most plants can find ways of stepping up productive efficiency through improved material handling—often with fairly modest outlays for additional equipment . . . Ingenuity's the key to getting the most from what you have.

♦ This producer revamped his gear hardening line to eliminate steps, combine operations and introduce several mechanical handling devices . . . Result was to cut manual work at least in half.

By W. G. PATTON, Engineering Editor

♦ **REDUCE** manual handling on a volume operation and you're almost bound to cut down on time and expense. Detroit Transmission Div. of General Motors Corp. did just that in its gear hardening setup by coordinating heating and quenching and providing for automatic removal of quenched gears from the fixtures. By so doing, it cut manual effort by 50 pct or more.

Parts treated are through-hardened SAE 5140 reverse gears for use in Hydramatic automatic transmissions. Specifications call for holding these within 0.002 in. out of round. Taper and runout are also held within very close limits.

Several different requirements were satisfied in planning the heat treating setup. Very careful handling is required to prevent damaging the gears during treating. Use of Gleason quenching fixtures, equipped with automatic unloaders, makes possible maximum production per square foot of floor space. At the same time, a tight handling situation which might arise if operators had to both load and unload the quenching fixture is avoided, and working conditions are improved.

A stop-and-go conveyor contributes to the better arrangement, making it possible to accumulate work in batches to supply furnaces.

Hardening of the internal gears is accomplished quickly and efficiently. Except for the automatic quenching fixture unloaders, no fully automatic equipment is involved. Yet, it's safe to say that the production rate is just as high as if more elaborate and expensive handling equipment were used.

To understand this, it is necessary to follow the heat treat operation in detail.

As the machined and washed gears are delivered from the washing operation, they roll by gravity down a handling chute. These chutes, which also serve as storage areas, permit delivery of the gears to the belt conveyor with only occasional manual assistance.

Accumulates in batches

While a load is being accumulated, the gears may pile up two or three high on the conveyor. By pressing a button, the operator moves the conveyor ahead to the desired position in front of a heating furnace.

Thus, with a minimum of effort, the operator can accumulate a batch of parts for any of the three heat treat furnaces.

Next step is to remove the gears from the conveyor and place them in the furnace. As shown, operators do this with a special long-handled fixture or peel. Rotary Surface Combustion furnaces used are gas-fired radiant tube types, with 7-ft 7-in. diam hearth. Atmosphere is controlled with endothermic gas and balanced to eliminate scale accumulation. Doors are operated by foot control buttons.

Heat treat temperature is 1540°F. Gears re-

main in the furnace for about one hour.

At the end of this time, and again using his special handling tool, the operator picks up the heated gear and deposits it on the Gleason fixture. He then presses a button which starts the automatic quenching cycle.

Dies minimize distortion

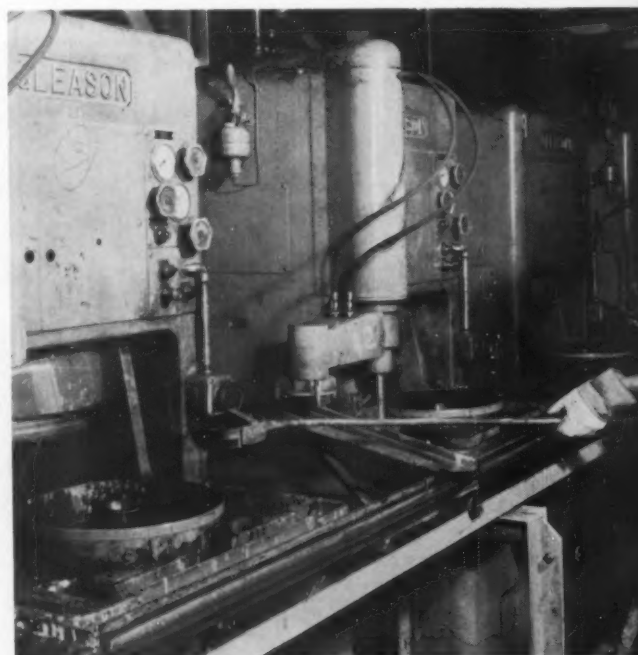
After the lower die fixture moves into position, the top die comes down. Parts are flooded with quenching oil, which pumps through openings in the fixture at a rate of 240 gpm. Since the gears are being tightly held between two accurate dies, distortion is held to a minimum.

The flow of oil stops without any manual assistance. The upper die then raises out of the way and the lower quenching die moves forward and up to unloading position. The Gleason unloader head then moves in, lowers, and grips the quenched part in adjustable jaws.

Rising, the unloader head rotates through 180° and releases the quenched gear onto a sloping steel track. The hardened gears move by gravity onto the conveyor, then to the end of the quench line.

This one conveyor serves the entire battery of nine quenching fixtures.

Gears next transfer automatically to a cross conveyor which carries them through another furnace. This heating operation performs the dual task of tempering and heating the gears prior to inserting a steel plate that is later staked into position.



SPECIAL HANDLING tool is used by operator in picking up heated gears, transferring them to special quenching fixture shown.

Quickly deployed—

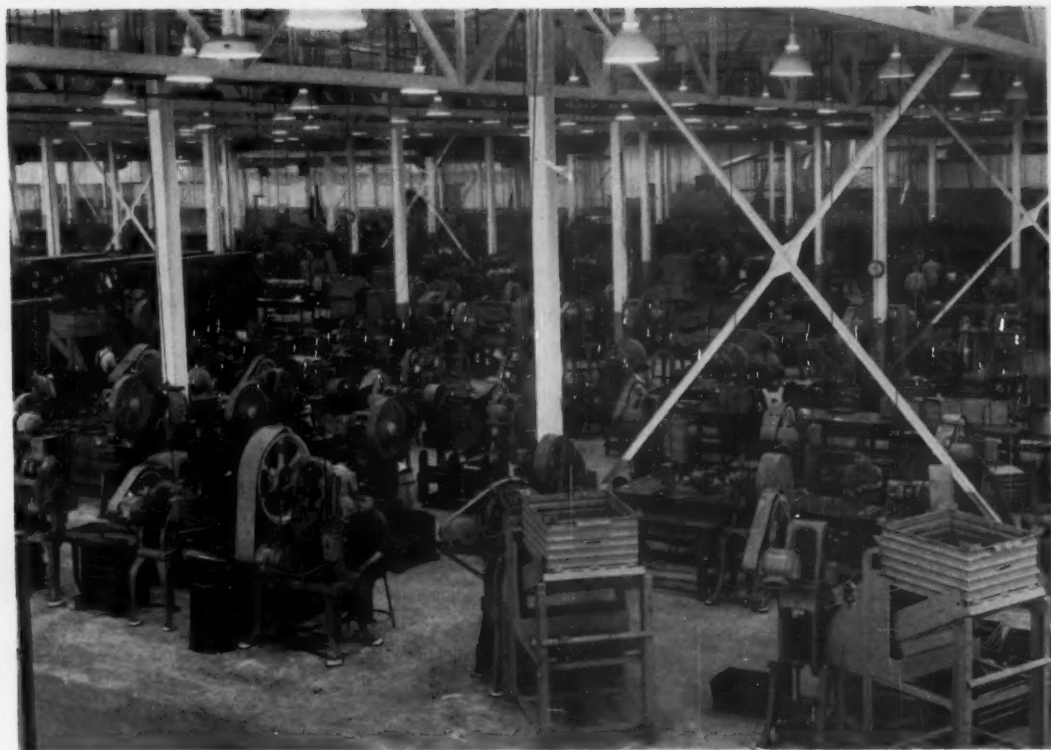
Job-Hopping Presses Keep Pace With Changing Needs



PLANT'S 150 punch presses, fitted with leveling vibration mounts, can be deployed quickly to almost any spot in the shop.

♦ It's a tall order, meeting ever-changing, contract-lot production requirements . . . Your competitive margin may depend on how quickly and inexpensively you can change setups to meet these needs.

♦ Morgan Spring Div.'s drive for efficiency has cut direct labor costs 20 pct . . . A major help was fitting their 150 punch presses with leveling vibration mounts . . . Now, forklifts dispatch presses quickly to any point where they're needed.



RELOCATED, this press is back in operation in a matter of minutes, following releveing. Quick-connect power plugs in from overhead ducts.

♦ **WHEN THE CHIPS** are down, a company's competitive position often rides or falls on one important factor—the relative efficiency of its plant layout. For plants doing job-lot work, efficient layout means flexibility of production lines.

An excellent example of what can be done, when a company takes the bit in its teeth to boost production line flexibility, is afforded by Wickwire Spencer Steel's Morgan Spring Div. Here, production contracts (and all work is on contract) usually run to a million or more pieces. Improving layouts to shave even a small fraction of a cent per piece from costs can add up substantially in the overall.

Improvements made, the company estimates, have cut direct labor costs alone by 20 pct.

Impetus for improving the division's capabilities came "from the top," in the form of a request from Mr. Al Franz, President of Colorado Fuel & Iron, that studies be made of the plant's layout and productive facilities. At the time, the Division was housed in multi-storied structures in Worcester, Mass.

One result of the studies was a decision to physically relocate the plant. A modern new one-level building was put up on Wickwire Spencer's Palmer, Mass., property—right at the Spring

Div.'s source of supply. This move alone eliminated a 50-mile material handling trek.

At the same time, the modern new building laid things wide open for plant engineers, material handling people and production experts to make up the most modern plant layouts, affording maximum efficiency for the job at hand.

On each job-lot contract now the Company may move two, six, a dozen or more punch presses into in-line production, and in a matter of minutes. The heavy concrete floors were designed to take any of the production machines in any location, without special foundations.

Facilities easily reached

Electrical and other needed facilities carry out the flexibility theme. These were set up to be easily available in any part of the building. The structure itself has a 51-ft span for roof trusses and 18-ft minimum height clearance. It has brick walls, steel sash, and insulated aluminum panels.

The master plan for straight-line flow in the new facility charts the course of production from the wire mill on the north side to shipping at the south side of the building, on the edge of the highway.

Between these points are all the modern pro-



BANK OF punch presses perform the same bending operations on automotive springs, for high production rate of priority order.

duction facilities required. These include tempering furnaces, wire storage, wire coiling machines, presses for drawing, stamping and forming, and heat treating and inspection facilities. Machinery is reshuffled as required for each important order, since the company feels there's always a better arrangement possible for a given job at a given time.

Here's how the Morgan Spring's plant engineer has set up his equipment to provide capacity where and when it's needed.

To begin with, almost all of Morgan Div.'s 150 punch presses are fitted with Barry machinery mounts. These movable mounts, with built-in leveling devices, eliminate the need for lagging presses to the floor. Essentially they are vibration isolators, which keep the press from "walking" during operation.

Moved in few minutes' time

With these mounts, shifting the presses around the plant for more efficient production becomes a simple task. They're simply lifted and moved by an industrial truck, set down and put back into operation—all in a few minutes' time. Power feeds from continuous overhead bus ducts to any location on the floor.

Sometimes the flexible production line starts in the toolroom. Since Morgan makes its own special tooling, it often proves easier and faster simply to move the machine into the toolroom if the setup is somewhat complicated. Too, this way of handling it prevents cluttering up production areas.

Plant lines do not operate full tilt, of course. At any one time, perhaps only half the machines may be working in production. The rest will be "banked" for maximum economy of floor space in the plant.

With this arrangement, if six presses are needed, for instance, for progressive forming operations, the type machines which can take the forming tools are drawn from the bank. Or the same machine may be used on different contracts for drawing, stamping or forming. It is then taken from the bank as the need arises, and moved onto the production floor.

As new machines are moved into the line, machines no longer required are moved out for storage in the bank.

Handling considerations affect line

Material handling considerations usually dictate the arrangement of the production line itself. Production may involve swaging the ends of spring rods, for instance. In such cases, the nearer the presses can be located to the swaging machine the better.

Sometimes a half dozen presses will work together, each handling a different forming, drawing or stamping operation. Then the line may be set up with trays between machines, the finished work tray from one machine becoming the pickup tray for the next.

When high priority orders require two or more presses to perform similar operations, efficient materials handling may dictate that they be banked in the same area.

The new line may, for example, be made up of six presses to run 15 days, or to produce 1½ tons of springs in eight hours.

Use of movable mounts meant a huge initial economy when presses were first moved into the new plant from Worcester. The foreman of the moving operation for the Roger Sherman Transfer Co. estimates savings of probably 60 to 70 pct over what installation costs would have been had the 150 presses been lagged to the floor.

Usual practice with the lagging arrangement is for the press to be moved into the required location first, while the area is marked out and lag holes are spotted. Then the press is removed and the holes are drilled. Finally, the press is moved in a second time and shimmed to level, before being bolted.

Installing the Barry mounts originally is simpler. The machine is first raised from the floor, usually with a fork lift truck. Mounts are then slipped under each leg, bolts being inserted through holes in the legs of the machine.

Leveling with a wrench is the final step. This entire operation usually takes only 15 minutes or so.

Time spent relocating the presses is negligible. Once fitted with the mounts, the machines can be moved just as fast as it takes to pick it up, transport it, re-level, and plug in the quick-disconnect fitting of the power line.



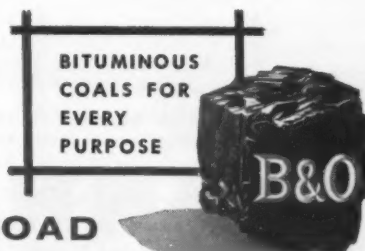
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New Technical Literature:

Catalogs and Bulletins

Bronze globe valves

Two pressure classes of a company's bronze globe valves are given in a new four page circular. It describes the firm's original valve, rated at 150 lb. S.P., 300 lb. W.O.G., and the new valve, rated at 200 lb. S.P., 550° F., 400 lb. W.O.G. Both types are manufactured in eight different sizes, from 1/4-in. through two in. diameters. Both bronze globe valves are equipped with Brinallloy seats and discs that in five years of actual service in the field, have required no repair or maintenance. It includes ASTM, ASME and military specification numbers of the alloy. *Lunkenheimer Co.*

For free copy circle No. 1 on postcard, p. 113

FOR YOUR COPY

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, page 113.

Spray lubrication

Spray lubrication systems for open gearing and slide surfaces are covered in a three color, illustrated booklet. It offers descriptions of manual and automatic systems and component equipment with schematic layouts. Actual application views appear. *The Farval Corp.*

For free copy circle No. 2 on postcard, p. 113

Aluminum cleaners

New four page brochure gives a description of aluminum cleaners. It also outlines systems that are being used successfully in preparing aluminum for welding. *North-west Chemical Co.*

For free copy circle No. 3 on postcard, p. 113

Precision gage

Principles of air gaging with a new precision gage are given in a 12 page catalog. It features basic tooling for inspecting internal and external dimensions and conditions. Types and sizes of adjustable air-gage tooling are included. Many illustrations of single and multi-dimension gage applications are covered. *The Sheffield Corp.*

For free copy circle No. 4 on postcard, p. 113

Magnetic controls

Magnetic controls and logic functions for industrial control are discussed in an eight-page booklet. Photographs, drawings, and circuit diagrams aid discussion of basic "and," "or," "not," and "memory" logic functions; the circuitry providing these functions, including the basic magnetic amplifier circuit; and current applications to industrial control. *Westinghouse Electric Corp.*

For free copy circle No. 5 on postcard, p. 113

Liquid rosin flux

Description, uses, properties and methods of application of a liquid rosin flux (non-activated) are now available in a new technical fact sheet. A helpful graph showing the concentration-density relationship of the flux and the company's flux thinner is included. This information is recommended by the firm for those involved with problems of electrical, electronic and printed circuit soldering. *Alpha Metals, Inc.*

For free copy circle No. 6 on postcard, p. 113

PRICE LIST

ON HANNIFIN STOCK HYDRAULIC PRESSES

| | |
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| 1-TON | \$ 552 |
| 2-TON | \$ 627 |
| 5-TON | \$1,306 |
| 8-TON | \$1,356 |
| 10-TON | \$1,855 |
| 25-TON | \$3,401 |

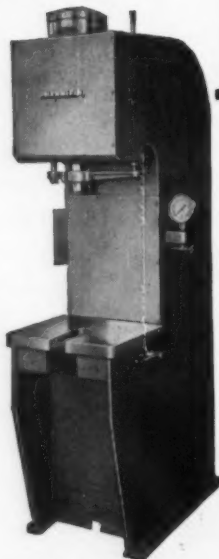
Prices complete with motors and starters F.O.B. our press plant, St. Marys, Ohio, subject to change without notice.

DELIVERY FROM STOCK

Demand for these popular presses is so consistent we are able to produce them in quantity and pass the savings along to you.

Construction-wise and quality-wise these small general-purpose presses are identical to the larger Hannifin presses, up to 150 tons. Special, optional controls when needed.

WRITE for complete information on the Hannifin Hydraulic Press you're interested in.



HANNIFIN

HANNIFIN CORPORATION, 513 S. WOLF ROAD, DES PLAINES, ILLINOIS

Industrial machinery

Blowers, exhausters, pneumatic systems, filters, flotation equipment, separators, stills, smooth-flow tubular pipe and fittings and industrial vacuum cleaners are described in new reading matter. The folder provides a quick and ready reference for plant engineers and designers. *Industrial Div., U. S. Hoffman Machinery Corp.*

For free copy circle No. 7 on postcard, p. 113

Weights and measures

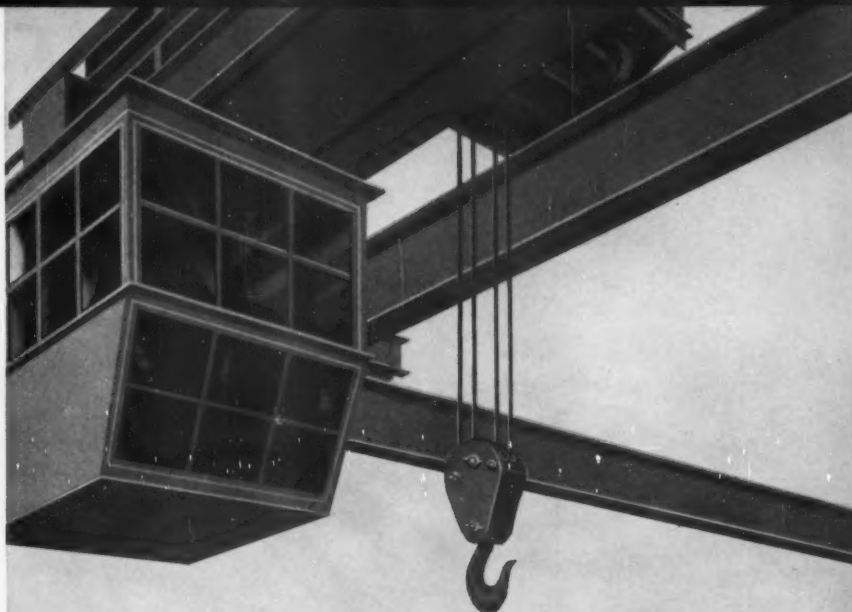
"Useful Tables of Weights and Measures" has been revised and enlarged in a new 1956 edition. This 96 page book is filled with information on the most wanted tables, charts, and formulas. It includes sheet gage tables; hardness and temperature conversion tables; properties of metals with their approximate weights; pipe sizes, dimensions, and weights; relative sizes of ingots and forgings at various reductions; welding symbols; nominal composition and typical mechanical properties of wrought aluminum alloys; metric conversion tables; trigonometric functions and formulae; properties of the elements; and other information. *Mesta Machine Co.*

For free copy circle No. 8 on postcard, p. 113

Malleable iron

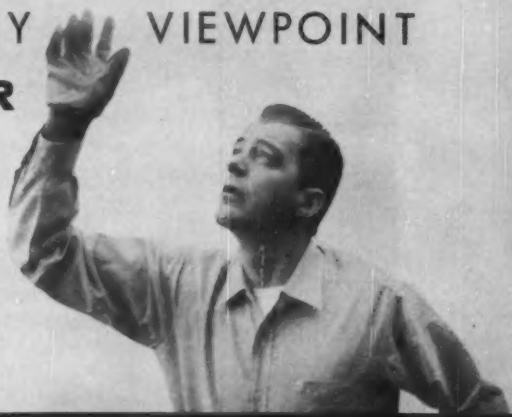
Pearlitic malleable iron is described in the second of a series of pamphlets published by this company. The 24-page booklet describes pearlitic malleable iron as, "a family of ferrous materials which differ from ferritic malleable iron in that some of the carbon is intentionally retained in the combined form." The pamphlet was prepared by the company's technical staff. Machining, hardenability and high temperature properties' data included are the result of company sponsored investigation and research at the Engineering Research Institute and the Production Engineering Department of the University of Michigan. Investigation by the Naval Research Laboratory, Washington, D. C., provided the basis for statements regarding sub-zero temperature properties. *Albion Malleable Iron Co.*

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FREE LITERATURE

Spray nozzles

Over 100 industrial spray nozzles of all kinds and sizes are illustrated in a recently issued 28 page catalog. Operating principles, capacities, applications, spray angles and other specifications are featured. *Binks Mfg. Co.*

For free copy circle No. 10 on postcard, p. 113

Brush springs

Publication of comprehensive data for the design of constant-pressure brush springs for rotating electrical machinery has been announced. A bulletin describes advantages gained from application of a particular constant-tension spring as a carbon brush spring. In addition, the 20 page, technically illustrated booklet discusses physical and operational characteristics, design principles and application limitations. Actual brush holder applications are described. Design procedures and charts are also presented. *Hunter Spring Co.*

For free copy circle No. 11 on postcard, p. 113

Precision bearings

New 128 page catalog lists a complete line of precision bearings. A section on engineering data and computations is included. This section, recommended for engineers and specifiers of bearings, features a listing of formulas and data for use in determining numerical values for loads to which bearings are subjected. These show how to compute hp and torque; how to determine values of radial and thrust loads (individually and in combination); how to equate distribution of loads in relation to bearing location; and how to compute radial loads due to belt, chain, or rope drives. Specifications and dimensions are listed for each type and size of bearing in the company's line. Miscellaneous data includes an interchangeability chart listing model numbers for similar bearings of other manufacturers; a table of bearing weights; a table listing decimal inches and millimeters for fractions of an inch from 1/64 to one in. and a table of decimal inch equivalents for readings from 26 to 100 mm. *Bearing Div., McGill Mfg. Co. Inc.*

For free copy circle No. 12 on postcard, p. 113



*When you need
a prescription in
spring steel -
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Band Saw Steels • Camera Shutter Steel • Clock and Watch Spring Steels • Compressor Valve Steel • Doctor Blade Steel • Feeler Gauge Steel • Flapper Valve Steel • Knife Steels • Matrix Band Steel • Piston Ring Segment and Expander Steels • Razor Blade Steel • Shim Steel • Shock Absorber Steel • Spring Steels • Textile Steels • Vibrator Reed Steel.

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FREE TECHNICAL LITERATURE

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

This section starts on p. 108.

Rolling mills

Rolling mills; wire, bar and tube drawing machines; centerless bar turning machines; bar straightening machines; rotary swaging machines, etc., are illustrated in a new brochure. Published by a British machine manufacturer, literature shows various models available to the metals industry. *Sir James Farmer Norton & Co., Ltd., Adelphi Ironworks.*

For free copy circle No. 13 on postcard

Industrial trucks

Many models of one firm's industrial trucks are listed in a bound 132-page catalog. For easy reference it is indexed into five categories. The first two sections are devoted to riding-type electric fork trucks and walkie electric fork trucks. "On-the-Spot" photographs show trucks in operation. Descriptive pages outline in detail specifications and construction features of all models. Stackers and cranes are described in a special section. Handlift trucks and floortrucks are covered in the final sections. *Lewis-Shepard Products Inc.*

For free copy circle No. 14 on postcard

Aluminum alloy

Up-to-date information on a major aluminum producer's alloy has been published in a new booklet. It describes various characteristics of the alloy and outlines finishability, anodizing qualities and in-service appearance as compared with another alloy. Engineering data is presented in the booklet, along with a table showing availabilities in sheet and plate. *Kaiser Aluminum & Chemical Corp.*

For free copy circle No. 15 on postcard

Vertical pump

Cutaway drawing shows components of one company's vertical pump. This chart is 42½ x 11 in. and gives a complete view on the pump's inner workings. Several smaller diagrams picture various drives and motors used to power the company's pumps. Data is given on heads, lifts and settings, capacity, horsepower, bowl sizes, fluid types, viscosity, and temperatures. It is printed in four colors. *Layne & Bowler Pump Co.*

For free copy circle No. 16 on postcard

Furnace controls

Strip chart, circular chart and circular scale instruments are introduced in a condensed catalog. Latest edition is devoted to instrumentation for metal processing application. It also includes specifications and prices of vane-type millivoltmeter controllers, thermocouples, radiation detectors, remote bulb thermometer controllers, flame failure safeguards, limit controls, electric and pneumatic valves. *Minneapolis-Honeywell Regulator Co.*

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Water chillers

Packaged water chillers for air conditioning or industrial cooling applications are explained in a new catalog. It describes mechanical specifications for sub-assemblies and components in these units. Chiller element construction details are discussed. A cutaway view of the element is included. The major advantages to the user of completely packaged and tested water chillers are also listed in the catalog. *American Blower Corp.*

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Transformers

Voltage stabilizing transformer bulletin gives transformer's features and data on where to use the equipment. Publication includes operating characteristics and specifications in its 16 pages. Bulletin is illustrated with application pictures as well as wiring diagrams and performance graphs. *General Electric Co.*

For free copy circle No. 23 on postcard

Forging and casting

The forging and casting division of a major steel corporation is described in a new 30 page catalog. Publication gives data on smooth hammered forgings, composite die sections and cast-to-shape tool steels. A new steel finder offers detailed information on forging and casting steel grades made by the division. *Allegheny Ludlum Steel Corp.*

For free copy circle No. 24 on postcard

Fluid power

Interesting, enlightening reading on fluid power applications is contained in new literature for those not too familiar with the subject. The illustrated, colorful 20 page pocket-sized booklet gives a brief review of the broad field. Capsule summations appear on numerous aspects of the use of fluid power. It is recommended reading for anyone, even laymen, interested in the art of controlling and applying smooth, effective power of pumped and compressed fluids (i.e.: oil, air) as used to push, pull, rotate, regulate or drive mechanisms. Booklet is published by the National Fluid Power Assn. *Miller Fluid Power Div., Flick-Reedy Corp.*

For free copy circle No. 25 on postcard

Throwaway tools

Tool holders and triangular and square throwaway carbide inserts are listed in a new publication. Now available for fast delivery, these mass-produced tools and edges are described as reducing production costs while increasing cutting efficiency. *Besly-Welles Corp.*

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Crane operation

Pocket sized crane operation and hitching manual has been issued for instruction in safety rules and practices. Illustrated with drawings and photos, the 75-page manual carries rules relating to crane operation, describes safe hitching equipment and practices, and provides safe load tables for various types of slings, shackles, "S" hooks, and eyebolts with instructions for their use. *Allis-Chalmers Mfg. Co.*

For free copy circle No. 19 on postcard

Hardsurfacing

Publication of a comprehensive comparison chart for selection of hardsurfacing welding materials has been announced. Chart makes it easy for hardsurfacing material users to select the company's rod for their application in comparison with other rods available. *Rankin Mfg. Co.*

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Powder metal presses

One firm's complete line of powder metal presses, comprising in all 37 different models is described in a new 24 page catalog. Ranging in capacity from 1½ tons to 300 tons, they include both single-punch and rotary types. Included are a 50-ton multiple motion press, a 300-ton hydraulic press for making large parts up to 12 in. in diameter, and a new high-speed rotary press of 10 ton capacity. *F. J. Stokes Corp.*

For free copy circle No. 21 on postcard

Carbide tools

Carbide rotary cutting tools are covered in a new booklet. It presents one manufacturer's line of solid carbide end mills, rotary files and miniature cutters. It also explains tools' use for scale and flash removal, blend and twist welds, machining in tight spots, as well as de-burring, counter-sinking, and chamfering. Several tables explain speed range in surface feet per minute for various metals, and a cutting speed conversion chart covering cutting head diameters from ⅛ to one in. *Abrasive Div., Elgin National Watch Co.*

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HANDLES MORE STEEL AT LOWER COST!

At Lehigh Structural Steel, a 25-ton American DiesElectric* Locomotive Crane performs numerous steel handling jobs at profitable speeds and lower cost! Typical uses include unloading incoming steel, loading outbound fabricated steel and doing various materials handling jobs around the firm's Allentown, Pa., plant. A special use of their DiesElectric—one that demonstrates the precision of American's air controls—involves check-fitting Lehigh fabricated structural steel towers. This operation calls for movements as small as 1/4-inch to bring heavy steel members into alignment—a task that sensitive, responsive air controls make routine! High boom jobs are frequent at Lehigh, too, and American's sky-wide visibility keeps the boom tip in sight at all times!

Across the country, manufacturers, processors and distributors of heavy metal products have discovered that fast, efficient, trouble-free Americans pay for themselves in a hurry! For detailed specifications on 25 to 50-ton American DiesElectric Locomotive Cranes, write:

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WELDING: Quick-Change Resistance Welder

Versatile welder permits rapid tooling change-over . . . As designs switch, new dies are substituted for use with the same welder . . . Change-over takes about one hour . . . This slashes previous down-time one-half.

Designed to permit rapid tooling change-over, a versatile resistance welder cuts previous down-time 50%. It is adapted to weld redesigned automobile guard shells for each year's model changes.

Average 300 Per Hour

Production of the bumper guards averages 300 assemblies per hour at the Eaton Mfg. Co., Stamping Div., Cleveland. Change-over for various guard models took two hours with standard welders formerly used. Change-over time of the new welder aver-

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ages one hour. As bumper guard designs are changed, new dies are substituted for use with the same welder.

The special four head projec-

tion welder produced by the Taylor-Winfield Corp., Warren, Ohio, performs two pairs of welds in rapid sequence. Each operation welds one of the two mounting plates normally joined to the bumper guard shell. This sequence firing minimizes electrical



Operator adjusts unit to make two weld pairs in sequence.

power demand. It is also possible to perform both welds simultaneously.

On shells requiring only one mounting plate, welding current is fed to only two welding heads. Separate 200 kva transformers and individual electronic controls are provided.

Metals:

Chromium-carbide holds up under heat, time.

A large Mid-Western manufacturing concern needed a material that would withstand the destructive effects of a high temperature (1600° to 2000°F.) reducing (am-

Perforations perplexing you?

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If you have a design problem that's got you down maybe Hendrick can be of help. Sometimes the easiest and quickest way to enhance a product's beauty is to include a pleasing pattern of perforations in its design. Hendrick perforated metal not only helps increase a product's overall attractiveness, but also adds to its saleability as well. And whatever material you're using . . . whether it's metal, masonite, rubber, plastic, hard or insulated board for decorative display or fabricating purposes you can draw on Hendrick's long experience and perforating facilities to fill the bill. Write for details.

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monia) atmosphere for long periods of time. After reviewing all aspects of the situation, the firm decided on the use of Grade CR-2 chromium carbide for its shafts, bearings and other parts.

Many Parts Withstand Use

For eight months, these parts were used continuously at 2000°F five days each week and idled at 1600°F the remaining two days. At the end of this period, when the equipment was shut down for repairs, the parts were examined. Ninety of the 120 parts were still serviceable. Only 30 had to be replaced due to warpage caused by distortion of the support members.

Examination of one of these used parts resulted in a report by Firth-Sterling, Inc., the suppliers, which stated, "There appears to be comparatively small damage to the material when one considers the length of their service at 2000°F."

Further study of the used parts revealed that continued service at these high temperatures and corrosive atmosphere had not caused any breakdown of the bearing surfaces. The fit of the shafts in the bearings was essentially the same as when these parts were placed in service.

Safety:

Emergency hydraulic power aids rescue operations

When an industrial vehicle overturns, a machine's supports "give out" or a plant's wall collapses, employees are frequently trapped beneath the debris. It is at this point that such emergency equipment as hacksaws, torches, pry-bars, etc. are brought into play.

Device Saves Vital Minutes

A hydraulic tool manufacturer, prodded on by industrial safety engineers, recently introduced its own line of rescue devices. These are highly portable, hydraulically operated power units that can push, pull, spread, lift, clamp and press wreckage or machinery into



VULCAN Vairloy, used by Algonquin Tool & Mfg. Co., Chicago, makes dies with negligible distortion in hardening, that produce 100,000 TV bases per grind.

Solving troublesome problems

Here's another good reason why Vulcan tool steels are ahead—for present Vulcan customers and for you.

Algonquin Tool and Mfg. Company had a problem of making dies with absolute minimum distortion in hardening. Results were outstanding—heat treat distortion was negligible—close tolerances were met with a minimum of grinding after hardening—tools gave 100,000 stampings per grind.

If you have a tool steel or die problem—look ahead to Vulcan. A representative is nearby.

Vulcan Crucible Steel Division



H. K. Porter Company, Inc.

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Important operating factors, which add up to R-C plur-ability, account for the rapidly increasing use of Roots-Connersville Positive Displacement Vacuum Pumps for industrial processing.

- **Reduced horsepower at higher speeds**
(600 rpm and up) creates power savings up to 25% and far lower first cost of motors.
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from 4 gpm. to 40 gpm. Efficiencies not affected by changes in water temperature.

To see how leading industrial users make a profit from R-C plur-ability, write for details, in Bulletin 50-B-13.



ROOTS-CONNERSVILLE BLOWER

A DIVISION OF DRESSER INDUSTRIES, INC.



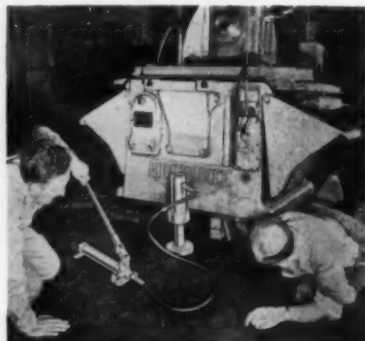
256 Ohio Avenue, Connersville, Indiana. In Canada—629 Adelaide St. W, Toronto, Ont.

TECHNICAL BRIEFS

any position. They save vital minutes when releasing a trapped victim.

Hundreds Of Combinations

"Industrial safety men," says the company, "have long urged us to develop this line. Although exact statistics are not available, data we do have vividly demonstrates that many lives have been lost simply because effective ex-



Portable power unit frees man pinned beneath machine.

trication tools have not been available. Prybars, hacksaws and other makeshift apparatus have often lost the race against death and fire. At best, where fire did not interfere, needless long minutes, often hours of frantic struggle were involved before the injured could be mercifully freed for medical care."

Remote Operation Possible

The rescue equipment comes in kits. These include a hand-operated pump and a ram, joined by a flexible hose to permit remote control of the ram. Remote operation makes them useful in hazardous or cramped quarters. The kits also contain attachments which thread onto the ram. Lightweight and easily carried, it can be simply assembled into hundreds of combinations, according to its designers and builders.

Four Basic Kits

Four basic kits are offered in four, ten, and 20 ton power packages. In addition, other tools are available from its makers, the Blackhawk Co. of Milwaukee, up to 100 ton.

Coating:

Many vinyl coats
replaced with one

Most users agree that vinyl coatings are excellent for preservation of metals. However, at least one person didn't agree that four to five coats of vinyl should be needed to gain required mil thickness.

Using a hot spray method, Mr. James Goodrich, general manager of Todd Shipyards Corp., Seattle, has demonstrated to his satisfaction that an equivalent mil thickness can be built in a continuous two pass (one coat) spraying operation.

The time savings are reported as considerable. Not only have they reduced their application time, but drying time between the multiple coats has also been saved.

Todd repairs all types of U. S. Navy and commercial ships, and also handles steel fabrication.

During a 45 day period after installation of hot spray, Todd



Hot vinyl is sprayed on dam gate by a shipyard employee.

had no reject finish jobs. This was despite spraying in temperatures that varied from 33° to 75°.

No Effect From Outside

Outside temperatures do not affect paint viscosity when using hot spray application, since material temperature is raised far above atmospheric temperatures.



HOW BIG IS YOUR LIFTING JOB?

Whatever the weight and size of the loads, *absolute dependability* is vital in crane service. That means complete reliability in structure and function. For no crane is better than its components.

"Shaw-Box" Cranes are recognized by industry the world over for enduring stamina and operational features that assure continuous performance, all-around safety and convenient, low-cost maintenance. They are the products of an organization responsible for many innovations now accepted as standard in crane manufacture. The same vision and resources are now creating new departures in overhead load-handling equipment to meet future needs. Consequently, your purchase dollars buy *plus value* when you invest in a "Shaw-Box" Crane.

If your plans call for a crane to handle 500-lb. loads or 300 tons or more, Shaw-Box offers you the widest choice of standard types and capacities available anywhere. There is no need for compromise. We will gladly work with your staff or your engineering counsel to make sure you get the right crane for the job, economically. Let us know your requirements or write for Catalog 219.

"Shaw-Box"® CRANES



MANNING, MAXWELL & MOORE, INC.

MUSKEGON, MICHIGAN

Builders of "SHAW-BOX" and "LOAD LIFTER" Cranes, "BUDGIT" and "LOAD LIFTER" Hoists and other lifting specialties. Makers of "ASHCROFT" Gauges, "HANCOCK" Valves, "CONSOLIDATED" Safety and Relief Valves, "AMERICAN" and "AMERICAN-MICROSEN" Industrial Instruments, and Aircraft Products.



**TEN AJAX DIHEDRAL COUPLINGS deliver
25,000 H.P. on new U & F mill at Weirton**

Close-up shows two of five pairs of Ajax Dihedral Spindle Couplings driving 23" and 56" x 52" 4 high 5 stand tandem cold mill built by United Engineering & Foundry Co. for Weirton Steel Co., a Division of National Steel Corporation.

► The critical eyes of steel men are focused on the design, performance and output of every new mill and all its components. This new 4 high, 5 stand tandem cold mill, designed for speeds up to 7200 fpm, was built by United Engineering and Foundry Co. for the Weirton Steel Co., a Division of National Steel Corporation.

It is turning out sheet of high quality finish and maintaining close gauge tolerance.

Power is transmitted from drive stands to rolls by 10 Ajax Dihedral Spindle Couplings handling 2500 H. P. each. The uniform angular velocity of Ajax Dihedral Spindle Couplings is an important factor in producing smooth finish, uniform thickness and long roll life.

Ajax Dihedral Spindle Couplings are in operation in America's foremost steel mills. They have been proved and approved by every test of time and service. Whether you are designing, specifying, building, using or modernizing mills, it will pay you to get the facts on Ajax Dihedral Spindle Couplings. Write for Bulletin No. 58.



Get first hand information at the Ajax Exhibit during the Iron and Steel Show, Booth Nos. 101-2-3.

AJAX FLEXIBLE COUPLING CO. INC.
WESTFIELD, N. Y.

TECHNICAL BRIEFS

Todd's spray units apply constant and controlled temperature to the vinyl to maintain constant viscosity. The heat reduces viscosity far below any workable level that could be reached with solvents alone. When the vinyl is atomized, fast solvents left in the material evaporate before the vinyl hits the steel, leaving a high solids film.

With hot spray there are no runs or sags; finish is smoother with less orange peel; they get better build and holdout; and coverage is improved.

Another Important Advantage

Another important advantage of hot spray application of vinyl reported by users is the increased film life. According to the Spee-Flo Co., manufacturers of hot spray equipment, users who have as much as four years experience with hot sprayed vinyl report up to 300 pct longer film life.

Average hot spray users report material savings of 25 pct, according to Spee-Flo, with most savings resulting from reduced overspray . . . although solvent savings are substantial.

Machining:

**Surface grinders turn out
14,000 blades a day.**

Surface grinders turn out 14,000 high carbon steel carpenter's plane cutters per eight hour day at one firm. This is about double the rate of old sand stone machines formerly used.

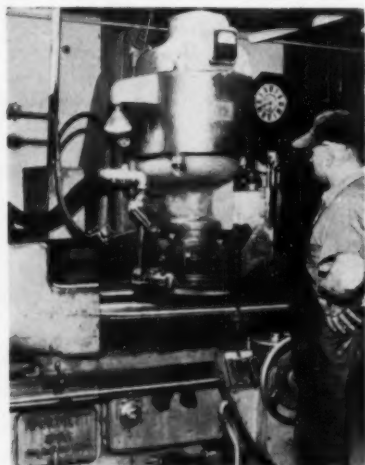
Whereas with old-time sand wheels, three men struggled to get them in place for a job, one now lifts a 10 lb. wheel and sets up the grinder by himself in less than half an hour. All this takes place at the Stanley Tool Div. of the Stanley Works.

Finish Not Improved

The surface grinders, manufactured by the Mattison Machine Works, Rockford, Ill., carry a massive vertical spindle with a wheel that spans the entire width of the grinder table. The grinders need-

ed to keep up with production are only half the number of the old sand stone machines. Finish obtained has not been improved, but there have been reported increases in accuracy, in reference to both sizing and parallelism.

Localized hardening (hard on one end and soft on the other) for blades for block planes make these especially difficult to grind.



This surface grinder holds a size tolerance to ± 0.005 in.

Wheel speed employed on grinding these is 1170 rpm. The feed is variable, extending through a range from 0.0015 to 0.0005 in. A table speed of 700 ipm is used. From ten to twelve thousandths of stock is removed from each of the two blades' edges. Preliminarily, these blades are produced by blacking them from strip steel. Hardening follows before the edges are ground. The size tolerance held is ± 0.005 in.

Wheel Costs Cut In Half

The wheel employed is a Norton, incorporating a No. 32 Alundum abrasive of suitable grit size, Grade E and Structure 12, vitrified bond, porous type. The coolant employed is sodium nitrate and borax, together with water. Wheel costs for processing these blades are much lower than was formerly the case, the reduction being about 50 pct. Setup time is reported as greatly reduced.

Keys...

TO
WALLINGFORD
Quality
STAINLESS STEEL
STRIP and TUBING

X-RAY SPECTROGRAPH

Automation GAGING Systems

ALL-NEW Metallurgical Laboratory

Whether it's the x-ray spectrograph utilized for chemical analysis . . .

. . . the automation gaging systems that provide positive, fully automatic control of steel strip thickness . . .

. . . or our all-new metallurgical laboratory (replacing our previous lab facilities), fully staffed and equipped for metallurgical and chemical research, development and quality control . . .

. . . WALLINGFORD HAS THE COMPLETE FACILITIES AND METHODS NECESSARY TO ASSURE QUALITY FROM RAW METAL TO FINISHED COIL, TUBE OR PIPE!

If quality is included in your specifications, call on Wallingford, where quality is not a word but a commandment! Write for your copy of "Wallingford Quality Tubing and Pipe" and Technical Data Sheets on super metals you are interested in.

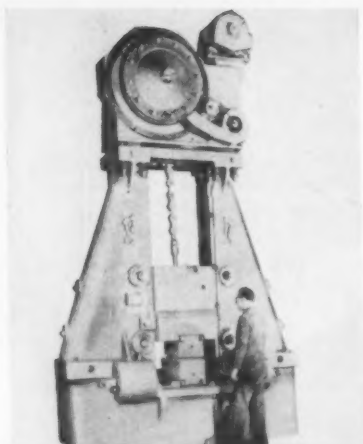


WALLINGFORD, CONN., U.S.A.

SUPER METALS
STAINLESS • ALLOY • HIGH CARBON • LOW CARBON • STRIP
STAINLESS WELDED TUBES AND PIPE

NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies... for more data use the free postcard on page 113 or 114.

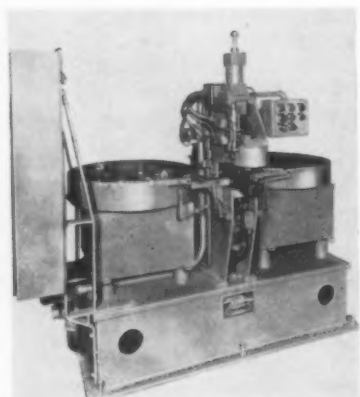


High-speed hammers have falling weight to 20,000 lb

This chain left drop hammer provides a lifting mechanism that overcomes disadvantages of belts, boards, etc., without the high cost of steam or air use. Built in Germany, the first hammer has been installed in the U. S. at the Cleveland Hardware & Forging Co., Cleveland. This is a 5000 lb unit. The hammer is built with falling weights up to 20,000 lb. Two features make it possible to handle such heavy weights and still maintain stroking speed: (a) a rubber-type compression member located inside the ram; and (b) a pro-

gressively increasing radius on the lifting spindle. Frame is of cast steel, heavily constructed. The hammer is spring bolted throughout. Guide gibs are of the insert type, hardened and ground, adjustable by means of wedge bolts. The frame is rigid, maintaining column spacing when moving laterally for die match, with no pinching of the ram, according to the manufacturer. The drive mechanism is insulated from the hammer by rubber buffers. *Eumuco of Germany.*

For more data circle No. 27 on postcard, p. 113

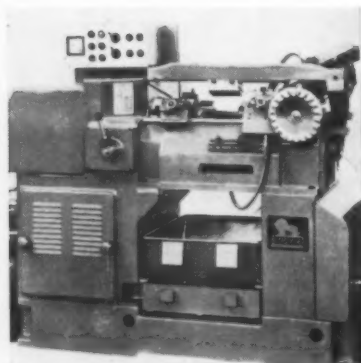


Electronic timer controls automatic assembler

Components are fed, positioned, assembled and unloaded without an operator on this automatic assembly machine. Its production is controlled by an electronic timer, and the rate is 1440 assemblies per hour at 90 pct efficiency. The machine features automatic lubrication. In addition, it has hardened and ground ways. Pneumatic equipment is in conformance with J.I.C. standards. Being just 82 in. wide x 38 in. deep x 70 in. high, it is extremely compact. Weight is ap-

proximately 5000 lb. One plant makes use of the machine for assembling automotive window lift assemblies. These come in two pieces: a coil spring and a stamped housing. Housings are fed from a hopper at one side; the springs from the other. Vibratory feeders are used for both parts. They are then positioned, assembled and unloaded. These functions are handled fully automatically. *Omer E. Robbins Co.*

For free copy circle No. 28 on postcard, p. 113

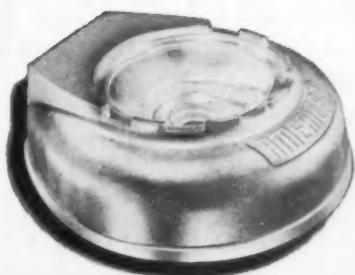


Versatility, uniqueness highlights of tracer lathe

Versatility is the foremost feature of an automatic copying lathe that combines advantages of a tracer lathe and a fully automatic cycling machine. Slides operate completely independently of each other. They are mounted in the rear and in the front of the bed so that any automatic turning operations can be carried out during one cycle. It is thus possible to machine many parts in a single set-up that hitherto had to be finish-machined

in secondary operations. Chucking or turning jobs between centers and short runs can be handled with ease. It swings on chucking work 6 in.; between centers 4 in. diam and admits a maximum workpiece length between centers of 10 in. Tailstock is air operated. It can be supplied with a synchronized spindle speed with that of the main spindle. *Ludw. Loewe & Co., represented by Eric R. Bachmann, Inc.*

For free copy circle No. 29 on postcard, p. 113



DON'T OVERLOOK ALUMINUM PERMANENT MOLD FOR



MORE CASTING VALUE PER DOLLAR



New production techniques and finishing services have doubled the use of aluminum permanent mold castings during the past three years.

Monarch's continuous-melt furnaces and new finishes, such as Velvaglaze® and Spectraglaze, are examples of Monarch-pioneered methods for mass-producing quality aluminum permanent mold castings. These castings offer superior strength, metal structure and finishing qualities.

Monarch's progress has been accomplished in conjunction with the steady expansion of our proven die casting operations. Monarch's "non-competitive" experience in both casting methods will give you the right answer for mass-producing your product at the lowest end-cost.

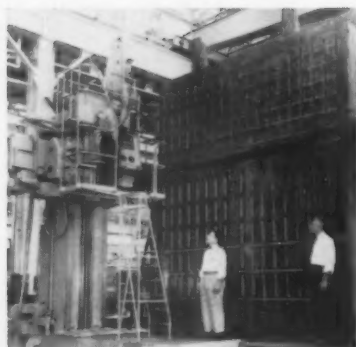
Velvaglaze, Spectraglaze and Monarcast are Trade Marks of



MONARCH ALUMINUM MFG. COMPANY—9205 DETROIT AVENUE—CLEVELAND 2, OHIO—OLympic 1-1700
MANUFACTURERS OF: Aluminum Permanent Mold Castings • Zinc Die Castings • Aluminum Die Castings • Exclusive Velvaglaze Finishing • and Spectraglaze, colorful Porcelain Enamel on Aluminum Permanent Mold Castings.

September 20, 1956

123

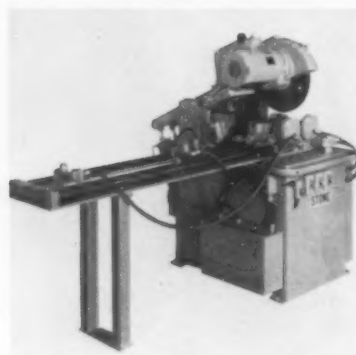


Keller, with fixture, weighs in at 146,000 lb

Weighing approximately 60,000 lb, this Keller automatic tracer controlled milling machine was recently installed in a major aircraft plant. It will be used to mill forgings. It has a horizontal travel of 14 ft and a vertical travel of 7 ft. The single spindle unit's fixture is of weldment construction to meet rigidity requirements caused by increased horsepower and a considerable increase in speeds and

feeds. It consists of two lower sections bolted together, each 7 ft wide x 9 ft 8 in. high x 4 ft 6 in. deep. Upper fixture bodies consist of two separate sections, each 7 ft wide, for mounting the model. Fixture is 14 ft wide and stands 16 ft above the machine table. Keller, complete with fixture, has a total weight of about 146,000 lb. *Pratt & Whitney Co.*

For more data circle No. 30 on postcard, p. 113

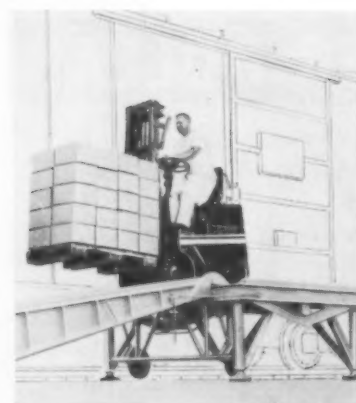


Cut-off machine handles production work

Specifically designed for cutting ferrous metals, a new cut-off machine is now equipped with fully automatic bar stock feed and power stroked head. This makes production line work possible. Speeds of 550 cuts per hour are maintained during production runs. Tolerances are held to less than 0.005 in. Work is turned out with a milled-like finish, eliminating further machining. The machine has a wheel wear compensator which adjusts for fast

approach and regulated speed of cutting operation by hydro check. This assures accuracy throughout the life of the wheel. Its cutting head is engineered with geared-in-head positive drive that delivers all the power to the cutting wheel. Built to handle tough cutting jobs on the production line, the unit will cut 1½ in. solid rounds with ease. It possesses rigid construction. *Stone Machinery Co.*

For more data circle No. 31 on postcard, p. 113

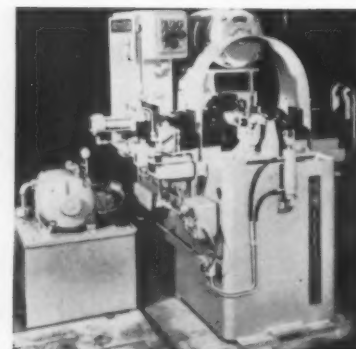


Magnesium platform good in tight areas

A portable platform table to be used in conjunction with one company's mobile loading ramp permits parallel loading of rail cars where track-side space is limited. Platform is ruggedly constructed of light weight magnesium. It measures 8 ft x 8 ft, and can be positioned by lift truck at car door opening. A mobile loading ramp is then locked in place at side of platform parallel to the track. Then, a dock board is used to bridge the gap between platform

floor and car entrance. Edges of the platform deck are equipped with patented safety-curbs to prevent power truck run-off. This also eliminates tire damage. Safety curbs are removable, permitting parallel loading from either side of rail car. Special diamond-tread, reinforced floor plate assures safe traction on platform. It is engineered for load capacities up to 16,000 lbs, according to the manufacturer. *Magline Inc.*

For free copy circle No. 32 on postcard p. 113



Machine rolls both right and left hand threads

Both right and left hand threads are now rolled on bicycle cranks in a single, automatic cycle with a new machine. This is done at a rate of about 120 parts an hour, including load and unload time. It consists of a floor-type base on which are mounted two roll units operated by a hydraulic sub-slide assembly. Crank is loaded between centers and clamped in the work holding fixture. A special oversize

unit rolls the 15/16 in.-24 right hand thread. After this retracts, a standard precision roll attachment rolls the 7/8 in.-24 left hand thread to complete the automatic cycle. The right hand thread rolls are extra large to clear the driving lug on the bicycle crank. Overall dimensions of the automatic threading machine are approximately 5 x 5 x 5 ft. *Sheffield Corp.*

For more data circle No. 33 on postcard, p. 113

LP gas tractors

Industrial tractors for tractor-trailer trains are now available for operation on LP gas. This results in easy starting, long engine life, moderate maintenance costs, no obnoxious exhaust fumes and low oil consumption, according to the manufacturer. Components of the LP gas system consist of filter, carburetor, solenoid valves, regulator, carburetor adaptor, and supply



tank. Their simplified construction makes maintenance relatively easy. In addition, their convenient arrangement to connecting power and water lines avoids interference with removal of existing units on the engine for servicing. *Mercury Mfg. Co.*

For more data circle No. 34 on postcard, p. 113

Cutoff wheel

All standard-make No. 2 pipe cutters and pipe machine wheel cut-offs can be fitted with a new honed edge cutter wheel. The specially-

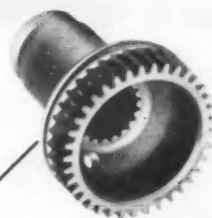


honed edge gives easier cuts, and is claimed to be harder and more durable. The wheels are priced the same as standard cutting wheels, company says. *Beaver Pipe Tools, Inc.*

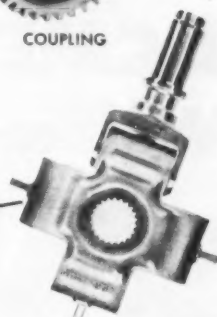
For more data circle No. 35 on postcard, p. 113

Perkins Precision Gears

Custom-Made
for SIKORSKY



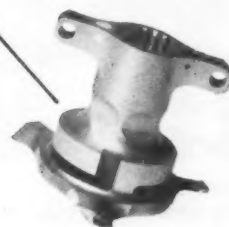
COUPLING



HUB and SPINDLE



TRUNNION



ACTUATOR

**...made by PERKINS
to SIKORSKY'S
specifications for
exacting, heavy duty service**

Before YOU order GEARS, Check Perkins!

PERKINS MAKES:

to customers' specifications, in all materials, metallic and non-metallic: bevel gears, ratchets, sprockets, ground thread worms, spiral gears, helical gears, spur gears with shaved or ground teeth.

NOTE: The PERKINS PRECISION SPRING COILER is the latest development in the spring coiler field and eliminates entirely the use of arbors and long set-up time. It is a complete self-sufficient machine and enables you to make the spring you want when you want it—in seconds. The coiler produces any type of spring, in any diameter and any pitch with this range: Wire sizes .005 to .125. Diameter, from 3/32" to 12" and larger. Size of the compact coiler is only 7 1/2" x 16". A POWER MODEL is available. Information on request.

PERKINS MACHINE & GEAR CO.
103 Circuit Ave., WEST SPRINGFIELD, MASSACHUSETTS

AUTOMATION at work ...supported by ACME Weldments



18,240 operations — 80 automobile transmission cases every hour! That adds up to quite a day's work, but it's no problem for this transfer machine built by the Baush Machine Tool Company of Springfield, Massachusetts. Unusual sectional design permits rapid retooling, keeps work handling to a minimum, and speeds production in many of America's largest automotive plants.

To provide the *strength* and *rigidity* required by this complex, automatic machine, Baush engineers specified all-welded steel bases fabricated by *Acme Welding*. Beside being stronger these Acme weldments are lighter and make possible the incorporation of many exclusive design features. Perhaps these advantages of Acme weldments are important to your product... whatever your requirements, why not call on Acme today.

A.S.M.E. U68-U69 Qualified Welders • A.P.I. - A.S.M.E. Approved
Underwriters Label and Inspection Service • Navy Approved
National Board Approved • Hartford Steam Boiler Inspection Service

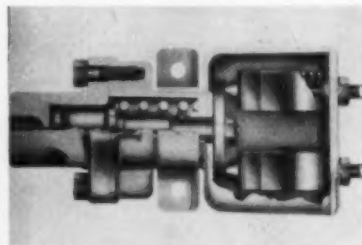
Send us your blueprints for a prompt quotation and ask for our informative booklet, "The FACTS about WELDMENTS and CASTINGS."

Acme WELDING
DIVISION of THE UNITED TOOL & DIE CO.
1044 NEW BRITAIN AVE., W. HARTFORD, CONN.

NEW EQUIPMENT

Piston pressure switch

A new pressure switch is capable of sensing two different pressures in one system and actuating independent electrical circuits at any two desired points. They may be used to maintain a pressure where the system pressure should not exceed or fall below predetermined values. They accurately sense any

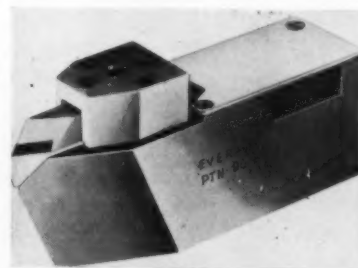


system pressure over an adjustable range of 15 to 3000 psi for proof pressures from 3000 to 7000 psi, depending on the switch setting. The switch incorporates two UL approved snap action switching elements rated for ac and dc circuits. Each switching element is electrically independent of the other. *Pressure Switch Div., Barksdale Valves.*

For more data circle No. 36 on postcard, p. 113

Carbide tool holder

Reduced tool costs are promised with a newly developed copying lathe carbide tool holder. Tests show tool and tip can machine alloys including: Stainless 52-100, K Monel, etc., at over 600 fpm. Advantages include: (1) neutral

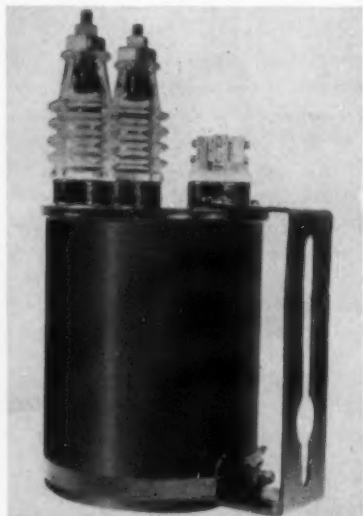


or positive rake permitting faster metal removal with the same or less horsepower, (2) infinitely adjustable, on-the-job carbide faced chip breaker. *Everede Tool Co.*

For more data circle No. 37 on postcard, p. 113

Small transformers

Outstanding new features of a new line of customized small transformers are universal-type mounting, low cost reliable terminal construction, aluminum casing, and rubber-covered leads. Line features multi-range regulator design ballast with primary voltages ranging from 100 to 520v. A single unit will serve



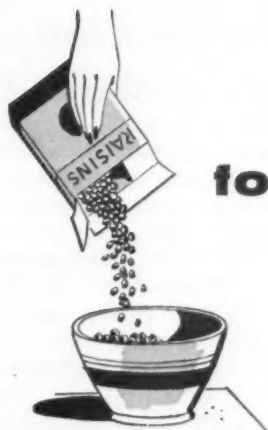
115-230v lines, and a second unit is available for 460-480v distribution. Universal-type mounting is accomplished with one basic unit. Heavy gauge seamless aluminum casing has weather-resistant paint finish. Covers are made of die-cast aluminum. They are spun-sealed to the casing and a special waterproof adhesive is used for sealing the joint. *Outdoor Lighting Dept., General Electric Co.*

For more data circle No. 38 on postcard, p. 113

Long drills

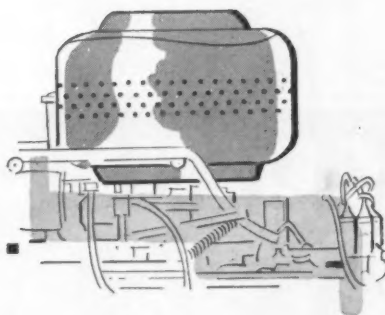
A wide variety of deep hole drilling operations can be performed with standard stock 18 in. drills. The new 18 in. Longboys are available in many fractional sizes ranging from 3/16 in. to 3/4 in. They are made from uniformly hardened high speed steel to provide straightness and symmetrical, highly polished flutes. The web is concentric with the diameter and the cutting lips possess an identical, superior finish. These factors result in an equally distributed cutting load. *Ace Drill Corp.*

For more data circle No. 39 on postcard, p. 113



for raisins

**or car
engines...**



you can use

CF&I INDUSTRIAL WIRE CLOTH

Versatile CF&I Industrial Wire Cloth helps assure the housewife of stem-free raisins and the automobile driver of an efficient vehicle. For raisin processors stem their raisins with a special CF&I Wire Cloth that has both round and square wires... and other specialized types of cloth are used in air filters for automobile engines.

If you make raisin-stemming equipment... air filters... or any other product which screens, filters, grades, cleans, processes or requires reinforcement, it'll pay you to get the complete story on CF&I Industrial Wire Cloth. Produced to your most exacting specifications, CF&I Industrial Wire Cloth can be

supplied in a wide variety of weaves and meshes made from ferrous or non-ferrous metals. Get the complete story from your CF&I representative today.

3696



THE COLORADO FUEL AND IRON CORPORATION: Albuquerque • Amarillo • Billings • Boise • Butte • Casper • Denver • El Paso • Ft. Worth • Houston • Lincoln (Neb.) • Los Angeles • Oakland • Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City • San Antonio • San Francisco • Seattle • Spokane • Wichita
WICKWIRE SPENCER STEEL DIVISION: Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans
New York • Philadelphia

CF&I OFFICE IN CANADA: Toronto

CANADIAN REPRESENTATIVES AT: Calgary • Edmonton • Vancouver • Winnipeg



Solenoid pilot valves live 25,000,000 cycles

Available in both two and three way types, a complete line of small solenoid pilot valves are capable of handling air, vacuum, oil, water and inert gases. They are designed for control of remote pilot operated valves or direct control of small cylinders and similar devices. Valves are extensively used in laboratories and on precision production equipment. Capacities range up to 23.8 cfm air and 3.8 gpm hy-

draulic. Valves are said to be capable of controlling over 600 cycles per minute. The solenoid enclosure is dust and moisture proof, completely sealed to prevent the entrance of splashing liquids or airborne contaminants. Normal service life is reputed to exceed 25 million cycles and solenoid coil is guaranteed against burn-out for the life of the valve. *Valvair Corp.*

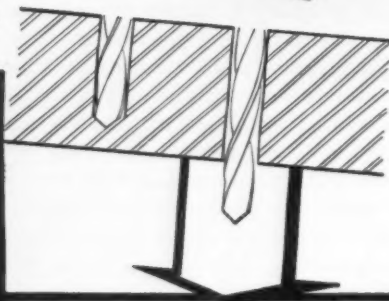
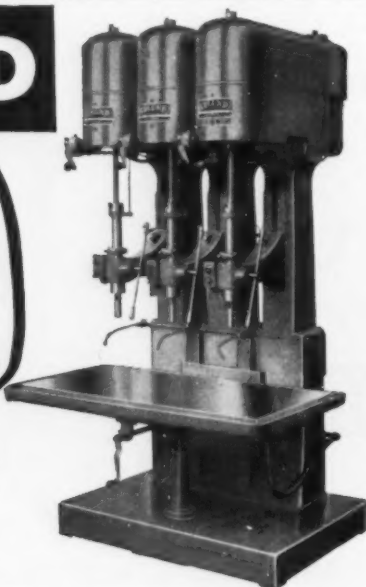
For more data circle No. 40 on postcard, p. 113

EDLUND

**Cuts Cost
\$1280.*
On One Job.***

An **EDLUND 2F**
Variable Speed

Drilling and Tapping Machine
Makes the difference



The job . . . drilling $\frac{3}{8}$ " hole $1\frac{1}{2}$ " deep in X1020 steel. The Edlund Variable Speed machine drilled 135 pieces per hour compared with 108 pieces per hour for standard machine production. The 25% increase in production reduced costs \$1280.*

Write for Bulletin #140, a colorful, illustrated booklet describing the Edlund 2F. Specifications and quotations prepared promptly on request . . . with no obligation on your part.

*Case history folder #SF on request.

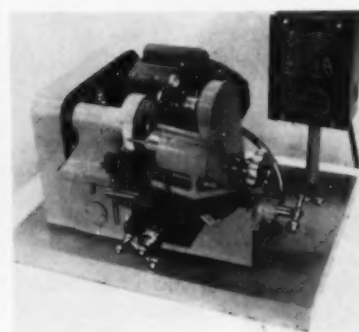
The Edlund 2F instant change variable speed feature lets you find correct drilling speed under practical on-the-job conditions. Saves valuable production time. No gear or belt changes necessary. Increases tool life by using correct drilling speed for each job requirement.

Standard or Special Models, 1 to 8 Spindles. 8", 12" or 15" overhang - capacity to $1\frac{1}{4}$ ". Available with Power Feed, Reversing Motor Tapper, Lead Screw Tapper, and Back Gears.

EDLUND MACHINERY COMPANY
Cortland, New York Representatives in Major Cities Division of Harsco Corporation

Pin grinder

Production has started on a new, low-cost precision pin grinder by a manufacturer of wire die finishing machinery. Originally developed for use by a large producer of tele-



phone equipment, this grinder will grind lapping pins or special parts up to a 90° included angle. *Dykrex-Roos Corp.*

For more data circle No. 41 on postcard, p. 113

Stand-up truck

An electric-powered, stand-up, center control fork truck, with a capacity of 10,000 lbs., has been announced. It features front wheel drive, rear wheel steer, and has a travel speed of 4.5 mph without load, 4 mph with a full load. Other features include: contactor control with automatic acceleration; four speeds forward and reverse. Direction and acceleration are through a single hand control lever. The frame is of heavy gage reinforced formed steel plates electrically welded into a rigid box structure. *The Elwell-Parker Electric Co.*

For more data circle No. 42 on postcard, p. 113

Two men assemble pre-fab truck body in an hour

Prefabricated all-aluminum truck bodies are now being made in kit form. Available in standard lengths of 12, 14, 16, 18 and 20 ft, they are shipped in five subassemblies: roof, two sides, front, and rear end assembly. Two men using wrenches as their only tools can assemble a complete shell in an hour. Use of these prefabricated bodies makes it possible for custom body manufacturers to produce a

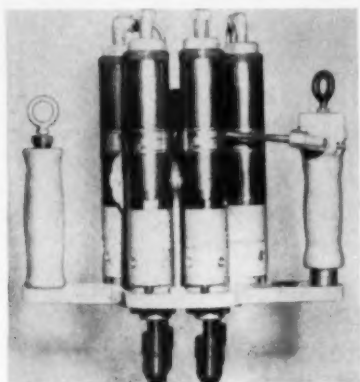
complete line of aluminum truck bodies without additional personnel. It also affords this "luxury" without the heavy capital investment which would be necessary for tooling to manufacture the parts involved. Kits are being made available to manufacturers and distributors of truck bodies. *Industrial Parts Div., Reynolds Metals Co.*

For more data circle No. 43 on postcard, p. 113



Multi-screw drivers

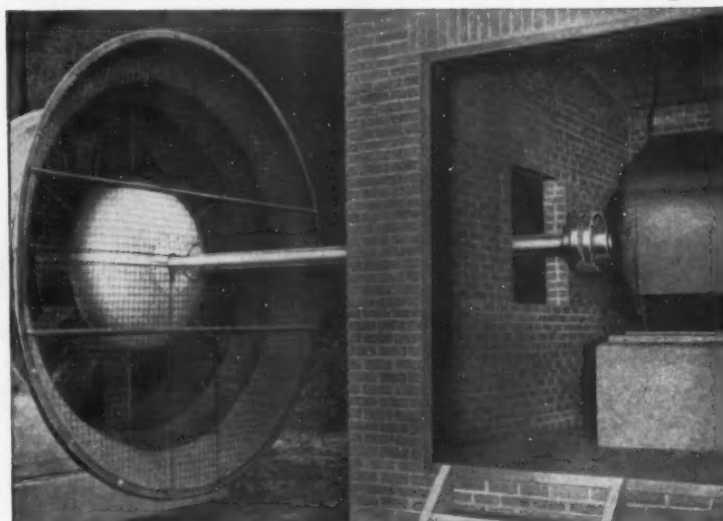
Multiple screw drivers and nut setters designed specifically for torques less than 11 ft-lb are now available. They are not conventional single-tool units adapted to multiple unit applications, but completely new designs. Two sizes of offset gear arrangements make allowable distances between bolt centers as low as 1 3/16 in. with standard parts. An offset attachment with a 2-to-1 gear ratio makes



it possible to attain up to 27 ft-lb of torque from the nut setters. Models are easily mounted and unmounted, disassembled and reassembled. Only a tube fitting and the screws fastening a tool to a mounting plate need be loosened to permit removal of the tool from the multiple unit. Tool speeds range from 225 to 2800 rpm, torques from 2.3 to 27 ft-lb. On-center or offset direct drives are available for nut setters. Screw drivers may use either drive coupled to the cushion clutch with a 1/4 in. axial float. *Keller Tool Div., Gardner-Denver Co.*

For more data circle No. 44 on postcard, p. 113

Eliminate Intermediate Bearings!



By using Thomas Flexible Couplings on long, unsupported shafts, intermediate bearings are eliminated. Thomas engineers tubular shafts free from lateral whip.

The large fan shown above is 16' from the motor to allow sufficient air intake. Miners working underground receive their fresh air supply from this fan and others like it,

which have been giving dependable service for as long as fifteen years... without shutdowns for lubrication or maintenance of the couplings.

Thomas floating shaft flexible couplings are recommended for machine and marine drives, printing presses, paper and cement mills, cooling towers, diesel engines, pumps, compressors, and many other uses.

Only Thomas Flexible Couplings offer all these advantages

UNDER LOAD and MISALIGNMENT

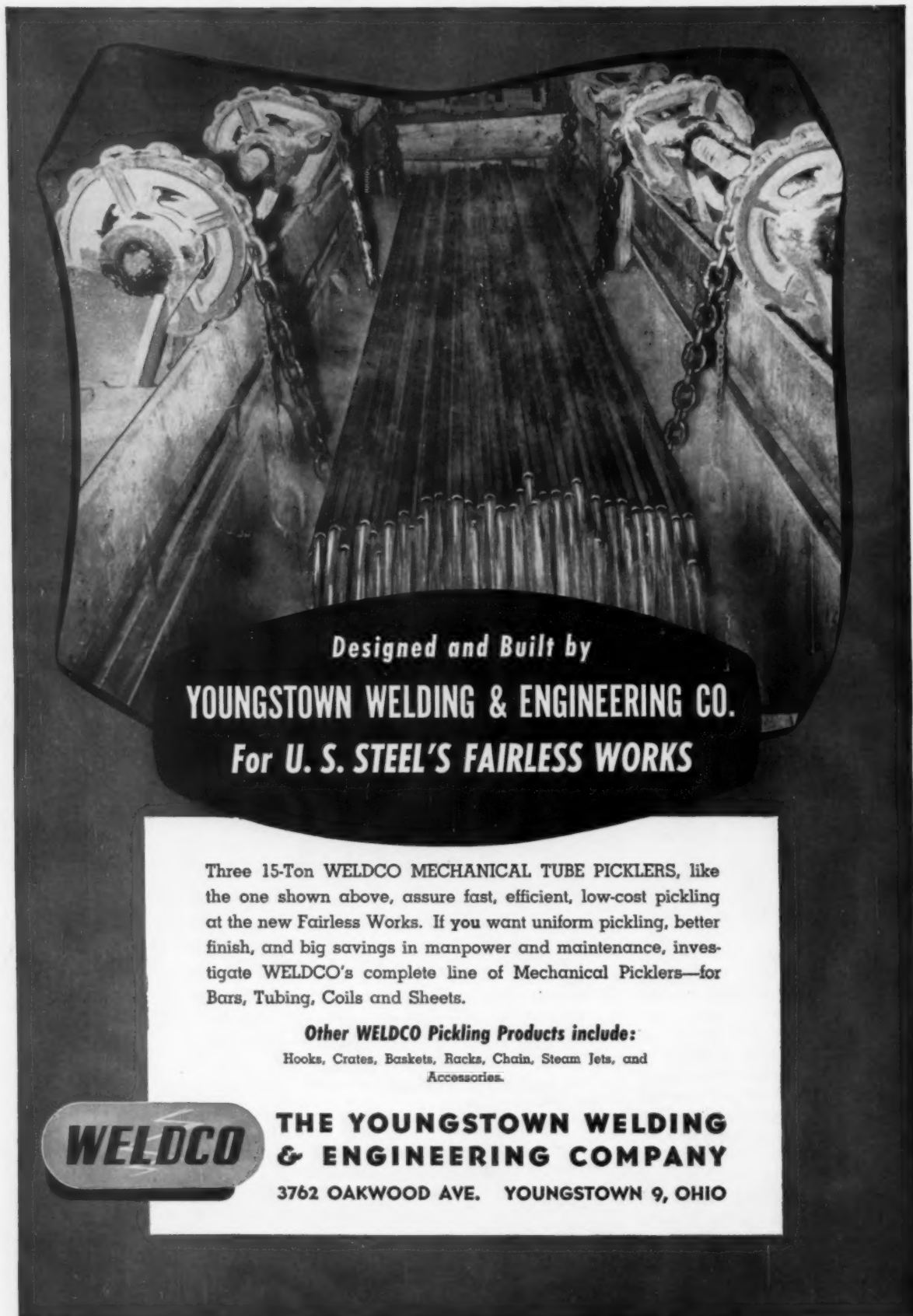
- | | |
|---------------------------------|-----------------------------------|
| 1. Freedom from Backlash— | Constant Rotational Velocity |
| Torsional Rigidity | 4. Visual Inspection in Operation |
| 2. Free End Float | 5. Original Balance for Life |
| 3. Smooth Continuous Drive with | ...and |

**THOMAS ALL METAL COUPLINGS HAVE NO WEARING PARTS
SO LUBRICATION AND MAINTENANCE ARE ELIMINATED**

Write for Engineering Catalog 51A

THOMAS FLEXIBLE COUPLING COMPANY

WARREN, PENNSYLVANIA, U.S.A.



Designed and Built by
YOUNGSTOWN WELDING & ENGINEERING CO.
For U. S. STEEL'S FAIRLESS WORKS

Three 15-Ton WELDCO MECHANICAL TUBE PICKLERS, like the one shown above, assure fast, efficient, low-cost pickling at the new Fairless Works. If you want uniform pickling, better finish, and big savings in manpower and maintenance, investigate WELDCO's complete line of Mechanical Picklers—for Bars, Tubing, Coils and Sheets.

Other WELDCO Pickling Products include:

Hooks, Crates, Baskets, Racks, Chain, Steam Jets, and
Accessories.

WELDCO

**THE YOUNGSTOWN WELDING
& ENGINEERING COMPANY**

3762 OAKWOOD AVE. YOUNGSTOWN 9, OHIO

The Iron Age SUMMARY...

Steel producers will be fencing off consumers for balance of year . . . Automotive buying tightens sheet market . . . Plate and structural consumers pressuring for controls.

Market Tough . . . Steel producers will be fighting a rear guard action with their customers for balance of the year—and beyond. Everything points to one of the tightest fourth quarter markets in years.

Desperate customers are turning in all directions for a way out of the dilemma. High-cost conversion deals are floating around looking for a home. Some producers, handicapped by recurring maintenance problems, are beating the bushes for ingots to bolster production.

Plate and structural consumers, in dire straits for months, are pressuring Washington for government controls on distribution of these products. But there's no easy way out. There's not much chance of controls being imposed. But even if they were, available supply would not be increased.

Automotive Back . . . Sheet consumers, too, are running into more trouble. With new models coming out, the automakers have taken their full quota—or close to it—for November. And what was left was snapped up by other consumers. Chances are the story will be the same for December.

Meanwhile, hot-rolled sheet consumers are finding that tonnages available to them are growing shorter. Some producers are passing the word that there won't be any hot-rolled sheet available after fourth quarter. Growing demand for cold-rolled sheets is making hot-rolled sheet business less attractive.

The tight situation in plate, structurals, and pipe is cutting into the amount of steel available for other products, creating a chain reaction that automatically makes other products harder to obtain.

Holes are beginning to appear in once-comfortable inventories. Strike losses combined with continued strong demand have thrown steel inventories out of balance.

List Grows . . . Forging bars and manufacturers wire are joining the critical list in some areas, particularly in Detroit. This is an indication that auto suppliers are going full steam ahead and some reportedly are having trouble getting all the steel they need.

Most mills are admitting privately that carryovers on many products will run to six weeks or more into next year.

Steel Output, Operating Rates

| | This Week | Last Week | Month Ago | Year Ago |
|-------------------------|-----------|-----------|-----------|----------|
| Production | | | | |
| (Not tons, 000 omitted) | 2,462 | 2,486 | 2,351 | 2,316 |
| Ingot Index | | | | |
| (1947-1949=100) | 153.3 | 154.8 | 146.5 | 144.0 |
| Operating Rates | | | | |
| Chicago | 101.0 | 103.0* | 97.5 | 96.0 |
| Pittsburgh | 99.0 | 98.0* | 95.0 | 99.0 |
| Philadelphia | 105.0 | 102.0 | 97.0 | 97.0 |
| Valley | 97.0 | 99.0* | 90.0 | 95.0 |
| West | 98.0 | 102.5* | 96.0 | 95.0 |
| Detroit | 101.0 | 104.0* | 95.0 | 92.0 |
| Buffalo | 105.0 | 108.0* | 107.0 | 102.0 |
| Cleveland | 103.5 | 110.0* | 99.0 | 102.0 |
| Birmingham | 96.0 | 96.0 | 87.0 | 96.0 |
| S. Ohio River | 89.0 | 90.0* | 76.0 | 82.0 |
| Upper Ohio R. | 100.0 | 101.0 | 99.0 | 101.0 |
| St. Louis | 88.0 | 96.0 | 92.0 | 92.0 |
| Northeast | 100.0 | 100.0 | 100.0 | 95.0 |
| Aggregate | 100.0 | 101.0 | 95.5 | 96.0 |

*Revised

Prices At A Glance

(cents per lb unless otherwise noted)

| | This Week | Week Ago | Month Ago | Year Ago |
|------------------------------|-----------|----------|-----------|----------|
| Composite price | | | | |
| Finished Steel, base | 5.622 | 5.622 | 5.622* | 5.174 |
| Pig Iron (Gross Ton) | \$63.04 | \$63.04 | \$63.04* | \$59.09 |
| Scrap, No. 1 hvy (gross ton) | \$58.83 | \$58.83 | \$57.50 | \$44.17 |
| Nonferrous | | | | |
| Aluminum ingot | 27.10 | 27.10 | 25.90 | 23.20 |
| Copper, electrolytic | 40.00 | 40.00 | 40.00 | 43.00 |
| Lead, St. Louis | 15.80 | 15.80 | 15.80 | 13.00 |
| Magnesium ingot | 36.00 | 36.00 | 36.00* | 29.25 |
| Nickel, electrolytic | 64.50 | 64.50 | 64.50 | 67.67 |
| Tin, Straits, N. Y. | 106.00 | 101.25 | 98.75 | 97.00 |
| Zinc, E. St. Louis | 13.50 | 13.50 | 13.50 | 13.00 |

*Revised

Automakers Tighten Squeeze

Purchases by the carmakers, particularly for sheet, further complicate the steel supply picture . . . Prices of many ferro-alloys are advanced by major producer.

♦ **AUTOMOTIVE ORDERS**, particularly for sheet, helped to tighten the squeeze in steel product supply still further this week.

In one market area, for example, the automakers placed orders for about 90 pct of the normal sheet tonnage for November. Remaining small amount of tonnage which had been held open was immediately gobbled up by other customers.

Size of the orders from Detroit just about slammed the door on new orders for this product during rest of the year by setting the general pattern of production ordering for 1957 auto models.

Upward revisions have been made in a number of ferro-alloy prices by Electro Metallurgical Co., Div. of Union Carbide & Carbon Corp. Weighted average of the price increases is 5.16 pct. (New ferro-alloy prices are listed on p. 147 of this issue.)

Electro Metallurgical also announced that in order to cover the higher cost of packing and sizing, all packing differentials for products sold both bulk and packed are increased \$4 per net ton of material. Charges for palletized shipments and for smaller-than-standard packages remain unchanged. All sizing differentials on material 2 in. x down and smaller are up \$2 per net ton of material. Exceptions are standard ferromanganese and materials not sold regularly in lump sizes.

Products on which prices are not advanced include ferrocolumbium, calcium metal, magnesium-ferrosilicon, nickel - zirconium, manganese - nickel - titanium, all grades of ferrotitanium, aluminum-vanadium, titanium sponge, ammonium metavanadate, and all tungsten alloys.

TINPLATE . . . Recent announcement that prices will go up 10¢ per base box on Nov. 1 doesn't seem to have resulted in an increase in tinplate shipments at Pittsburgh. No wave of price hedge ordering is anticipated. Reasons: Electrolytic tinning lines are running at capacity and mills are low in finished inventories. Also, the increase was only one-fourth that of last spring and isn't likely to cause can companies to borrow for inventory building.

Tinplate producers at Chicago are booked to capacity into 1957. Production continues at full speed, but pressure of pre-strike inventory buildup by canmakers is considerably eased. Producers there are closely watching an experimental canmaking plant designed to turn out can from coil stock.

SHEET AND STRIP . . . Auto industry orders took 90 pct of Cleveland area's sheet for Nov. Still to be rolled on sheet mills there are a pile of uncropped coiled plate booked in the summer during a lull in sheet business. Deliveries on cold-rolled strip are running 4-6 weeks, but some supply is available on shorter delivery. Auto orders have given slight spurt to cold-rolled strip. Rolling schedules for August will be finished by about the middle of Oct. and pro-

ducers are now turning out July orders and some tonnage promised, before the strike, for August.

At Pittsburgh, capacity production of hot- and cold-rolled sheets seems assured. Hot-rolled products are particularly tight, while cold-rolled outlook depends on how successful automakers are in selling 1957 models. Strong auto demand would mean a sheet pinch extending into next year. Right now mills are working with customers to fill up inventory gaps across the board. Shortage of steel due to breakdowns, plus the demand for plate and structurals is hurting.

In Detroit, fourth quarter projections indicate a car production of 1.7 million which is 300,000 to 400,000 less than in the same period of last year. However, Detroit area mills are sold out for the fourth quarter for all practical purposes, even though they are only open to the month of November.

PIPE AND TUBING . . . Pittsburgh producer reports demand for seamless tubular products is highest ever, even surpassing demand during war and postwar periods. Outlook is for capacity production all the way through 1957. In welded pipe, this same supplier is working around the clock.

Pipe and tubing producer at Chicago says the strike cost about 2 months' production. Company expects to go into the first quarter next year with "at least" a 6-week carryover. Mills there are generally sold out now for the fourth quarter on pipe and tubing.

WIRE . . . Production at Cleveland is starting a seasonal lull after a good year despite the strike. There's 2-3 week delivery on merchant wire items. Many other standard merchant products can be delivered from stock. Spurt from auto suppliers turning out parts for new models has filled order books for manufacturers' wire through Sept. into Oct. with deliveries running about 4-6 weeks. Some specialty wire and wire rope are booked into Nov. There's good demand in Detroit for all manufacturing grades of wire.

IRON ORE . . . Weekly Lake shipments hit 2.6 million tons for period ending Sept. 10. This brought total for the year to 45.3 million tons as compared to 58.9 million for same time last year. Average daily loadings are behind last year's at 383,947 tons as compared with 444,907 tons a year ago.

Purchasing Agent's Checklist

DISTRIBUTION: Complaints from independent steel fabricators and warehouses leads to Congressional probe p. 55

TECHNICAL: Is your machine shop safe to work in? p. 96

MARKETS: Oilfield equipment market is strong p. 57

WEST COAST: Why San Francisco is a good market bet p. 75

Comparison of Prices

(Effective Sept. 18, 1956)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

| | Sept. 18 1956 | Sept. 11 1956 | Aug. 21 1956 | Sept. 20 1955 |
|---------------------------------------|------------------|------------------|-----------------|------------------|
| Flat-Rolled Steel: (per pound) | | | | |
| Hot-rolled sheets | 4.675¢ | 4.675¢ | 4.675¢ | 4.325¢ |
| Cold-rolled sheets | 5.75 | 5.75 | 5.75 | 5.325 |
| Galvanized sheets (10 ga.) | 4.675 | 4.675 | 4.675* | 4.325 |
| Hot-rolled strip | 4.675 | 4.675 | 4.675 | 4.325 |
| Cold-rolled strip | 4.87 | 4.87 | 4.87 | 4.52 |
| Plate | 10.40 | 10.40 | 10.40 | 9.30 |
| Stainl's C-R strip (No. 802) | 47.50 | 47.50 | 47.50 | 44.50 |

| | | | | |
|---|--------|--------|--------|--------|
| Tin and Terneplate: (per base box) | | | | |
| Tinplate (150 lb.) cokes | \$9.85 | \$9.85 | \$9.85 | \$9.05 |
| Tinplates, electro (0.50 lb.) | 8.55 | 8.55 | 8.55 | 7.75 |
| Special coated mfg. ternes | 9.10 | 9.10 | 9.10 | 7.85 |

| | | | | |
|-------------------------------------|--------|--------|--------|-------|
| Bars and Shapes: (per pound) | | | | |
| Merchant bars | 5.075¢ | 5.075¢ | 5.075¢ | 4.65¢ |
| Cold finished bars | 6.85 | 6.85 | 6.85 | 5.90 |
| Alloy bars | 6.125 | 6.125 | 6.125 | 5.65 |
| Structural shapes | 5.00 | 5.00 | 5.00 | 4.60 |
| Stainless bars (No. 802) | 40.75 | 40.75 | 40.75 | 35.25 |
| Wrought iron bars | 11.50 | 11.50 | 11.50 | 10.40 |

| | | | | |
|--------------------------|-------|-------|-------|-------|
| Wire: (per pound) | | | | |
| Bright wire | 7.20¢ | 7.20¢ | 7.20¢ | 6.25¢ |

| | | | | |
|-----------------------------|---------|---------|---------|---------|
| Rails: (per 100 lb.) | | | | |
| Heavy rails | \$5.075 | \$5.075 | \$5.075 | \$4.725 |
| Light rails | 6.00 | 6.00 | 6.00 | 5.65 |

| | | | | |
|--|---------|---------|---------|---------|
| Semifinish Steel: (per net ton) | | | | |
| Re-rolling billets | \$74.00 | \$74.00 | \$74.00 | \$68.50 |
| Slabs, re-rolling | 74.00 | 74.00 | 74.00 | 68.50 |
| Forging billets | 91.50 | 91.50 | 91.50 | 84.50 |
| Alloy blooms, billets, slabs | 107.00 | 107.00 | 107.00 | 96.00 |

| | | | | |
|--|-------|-------|-------|--------|
| Wire Rod and Skelp: (per pound) | | | | |
| Wire rods | 5.80¢ | 5.80¢ | 5.80¢ | 5.025¢ |
| Skelp | 4.225 | 4.225 | 4.225 | 4.225 |

| | | | | |
|--|--------|--------|---------|--------|
| Finished Steel Composite: (per pound) | | | | |
| Base price | 5.622¢ | 5.622¢ | 5.622¢* | 5.174¢ |

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

| | Sept. 18 1956 | Sept. 11 1956 | Aug. 21 1956 | Sept. 20 1955 |
|----------------------------------|------------------|------------------|-----------------|------------------|
| Pig Iron: (per gross ton) | | | | |
| Foundry, del'd Phila. | \$47.75 | \$47.75 | \$47.75 | \$43.69 |
| Foundry, Valley | 63.00 | 63.00 | 63.00 | 59.00 |
| Foundry, Southern Cin'ti | 67.17 | 67.17 | 67.17 | 62.93 |
| Foundry, Birmingham | 59.00 | 59.00 | 59.00 | 55.00 |
| Foundry, Chicago | 63.00 | 63.00 | 63.00 | 59.00 |
| Basic del'd Philadelphia | 66.84 | 66.84 | 66.84 | 62.77 |
| Basic, Valley furnace | 62.50 | 62.50 | 62.50 | 58.50 |
| Malleable, Chicago | 68.00 | 68.00 | 68.00 | 59.00 |
| Malleable, Valley | 68.00 | 68.00 | 68.00 | 59.00 |
| Petromanganese, cents per lb. | 11.75¢ | 10.75¢ | 10.75¢ | 9.50¢ |
| 74 to 76 pct Mn base. | | | | |

| | | | | |
|--|---------|---------|----------|---------|
| Pig Iron Composite: (per gross ton) | | | | |
| Pig iron | \$63.04 | \$63.04 | \$63.04* | \$59.09 |

| | | | | |
|-------------------------------|---------|---------|---------|---------|
| Scrap: (per gross ton) | | | | |
| No. 1 steel, Pittsburgh | \$55.50 | \$55.50 | \$55.50 | \$44.50 |
| No. 1 steel, Phila. area | 58.50 | 58.50 | 57.50 | 46.50 |
| No. 1 steel, Chicago | 59.50 | 59.50 | 57.50 | 41.50 |
| No. 1 bundles, Detroit | 56.50 | 56.50 | 54.50 | 39.00 |
| Low phos., Youngstown | 66.50 | 66.50 | 65.50 | 47.50 |
| No. 1 mach'y cast, Pittsburgh | 60.50 | 60.50 | 60.50 | 46.50 |
| No. 1 mach'y cast, Philadel'a | 58.00 | 58.00 | 57.50 | 47.50 |
| No. 1 mach'y cast, Chicago | 59.00 | 59.50 | 59.50 | 52.50 |

| | | | | |
|---|---------|---------|---------|---------|
| Steel Scrap Composite: (per gross ton) | | | | |
| No. 1 heavy melting scrap | \$58.83 | \$58.83 | \$57.50 | \$44.17 |

| | | | | |
|---|---------|---------|---------|---------|
| Coke, Connellsville: (per net ton at oven) | | | | |
| Furnace coke, prompt | \$14.50 | \$14.50 | \$14.50 | \$13.25 |
| Foundry coke, prompt | \$17.18 | \$17.18 | \$17.50 | 16.25 |

| | | | | |
|---|---------|--------|--------|-------|
| Nonferrous Metals: (cents per pound to large buyers) | | | | |
| Copper, electrolytic, Conn. | 40.00 | 40.00 | 40.00 | 43.00 |
| Copper, Lake, Conn. | 40.00 | 40.00 | 40.00 | 43.00 |
| Tin, Straits, New York | 106.00* | 101.25 | 98.75 | 97.00 |
| Zinc, East St. Louis | 13.50 | 13.50 | 13.50 | 13.00 |
| Lead, St. Louis | 16.80 | 16.80 | 16.80 | 14.80 |
| Aluminum, virgin ingot | 27.10 | 27.10 | 25.90 | 23.50 |
| Nickel, electrolytic | 64.50 | 64.50 | 64.50 | 67.67 |
| Magnesium, ingot | 36.00 | 36.00 | 36.00* | 29.25 |
| Antimony, Laredo, Tex. | 33.00 | 33.00 | 33.00 | 33.00 |

† Tentative. ‡ Average. * Revised.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

STAINLESS STEEL

←To identify producers, see Key on p. 144→

| Producing Point | Basic | Fdry. | Mall. | Bess. | Low Phos. |
|-----------------|-------|--------|-------|-------|-----------|
| Bethlehem B3 | 64.50 | 65.00 | 65.50 | 66.00 | 66.00 |
| Birmingham B3 | 58.50 | 59.00* | 59.50 | 60.00 | 60.00 |
| Birmingham W9 | 58.50 | 59.00* | 63.00 | | |
| Birmingham U4 | 58.50 | 59.00* | 63.00 | | |
| Buffalo R3 | 62.50 | 63.00 | 63.50 | 64.00 | |
| Buffalo H1 | 62.50 | 63.00 | 63.50 | 64.00 | |
| Buffalo W6 | 62.50 | 63.00 | 63.50 | 64.00 | |
| Chester P2 | 64.50 | 65.00 | 65.50 | 66.00 | |
| Chicago J4 | 62.50 | 63.00 | 63.50 | 64.00 | |
| Cleveland A3 | 62.50 | 63.00 | 63.50 | 64.00 | 67.50† |
| Cleveland R3 | 62.50 | 63.00 | 63.50 | 64.00 | 67.50† |
| Duluth J4 | 62.50 | 63.00 | 63.50 | 64.00 | 67.50† |
| Erie J4 | 62.50 | 63.00 | 63.50 | 64.00 | 67.50† |
| Everett M6 | 63.75 | 64.25 | | | |
| Pontiac K1 | 70.00 | 70.50 | | | |
| Genora, Utah C7 | 62.50 | 63.00 | | | |
| Granite City C2 | 64.40 | 64.90 | 65.40 | | |
| Hubbard Y1 | | | 63.00 | | |
| Midland C11 | 62.50 | | | | |
| Minnequa C6 | 64.50 | 65.00 | 65.50 | | |
| Monessen P6 | 62.50 | | | | |
| Novilla Ia. P4 | 62.50 | 63.00 | 63.50 | 64.00 | 67.50† |
| N. Tawanda T1 | 62.50 | 63.00 | 63.50 | 64.00 | |
| Pittsburgh U1 | 62.50 | 63.00 | 63.50 | 64.00 | |
| Sharpsville S3 | 62.50 | 63.00 | 63.50 | 64.00 | |
| So. Chicago R3 | 62.50 | 63.00 | 63.50 | 64.00 | |
| Steelton B3 | 64.50 | 65.00 | 65.50 | 66.00 | 70.50 |
| Swedeland A2 | 64.50 | 65.00 | 65.50 | 66.00 | |
| Tule J4 | 62.50 | 63.00 | 63.50 | 64.00 | |
| Troy, N. Y. R3 | 64.50 | 65.00 | 65.50 | 66.00 | |
| Youngstown Y1 | | | 63.00 | 63.50 | |

DIFFERENTIALS: Add, 50¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.80 pct); 50¢ per ton for each 0.50 pct manganese or portion thereof over 1 pct; 32¢ per ton for 0.5 to 0.75 pct nickel, \$1 for each additional 0.25 pct nickel. * Add \$1.00 for 0.31-0.69 pct phos. † Intermediate low phos. Silvery Iron: Buffalo, H1, \$72.50; Jackson, J1, J4 (Globe Div.), \$71.50; Niagara Falls (15.01-15.50), \$99.50; Keokuk (14.01-14.50), \$102.00; (15.51-16.00), \$105.00. Add \$1.25 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 14 pct. Add 75¢ for each 0.50 pct manganese over 1.0 pct. Bessemer ferroalloy: \$44.00.

| Product | 201 | 262 | 301 | 302 | 303 | 304 | 316 | 321 | 347 | 403 | 410 | 416 | 430 |
|--------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Ingot, re-rolled | 19.75 | 21.00 | 20.50 | 22.00 | — | 23.25 | 35.25 | 28.25 | 32.75 | — | 16.00 | 27.75 | 16.25 |
| Slabs, billets | 24.50 | 27.25 | 25.25 | 28.00 | 28.50 | 29.25 | 44.50 | 35.75 | 42.00 | — | 20.75 | — | 21.00 |
| Billets, forging | — | 33.00 | 33.75 | 34.00 | 37.00 | 36.00 | 56.25 | 42.25 | 50.25 | 30.75 | 27.25 | 27.75 | 27.75 |
| Bars, struct. | 39.00 | 39.25 | 40.50 | 40.75 | 43.75 | 43.00 | 66.75 | 50.25 | 59.00 | 36.25 | 32.50 | 33.00 | 33.00 |
| Plates | — | 41.25 | 42.50 | 43.00 | 45.50 | 45.75 | 70.25 | 54.50 | 63.75 | 38.75 | 33.75 | 35.50 | 34.50 |
| Sheets | 45.00 | 45.25 | 47.25 | 47.50 | 55.75 | 50.25 | 74.75 | 60.00 | 73.00 | 46.50 | 38.75 | 46.50 | 39.25 |
| Strip, hot-rolled | 33.00 | 35.75 | 34.00 | 36.75 | — | 39.75 | 63.50 | 48.75 | 58.25 | — | 29.75 | — | 30.75 |
| Strip, cold-rolled | 41.50 | 45.25 | 43.75 | 47.50 | 52.00 | 50.25 | 74.75 | 60.00 | 73.00 | 46.50 | 38.75 | 46.50 | 39.25 |
| Wire CF; Rod HR | — | 37.25 | 38.50 | 38.75 | 41.75 | 41.00 | 63.75 | 48.00 | 56.25 | 34.50 | 31.00 | 31.50 | 31.50 |

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., C11; Brackenridge, Pa., A3; Butler, Pa., A7; Vandergrift, Pa., U1; Washington, Pa., W2, J2; Baltimore, E7; Middletown, O., A7; Massillon, O., R3; Gary, U1; Bridgeville, Pa., U2; New Castle, Ind., I2; Ft. Wayne, J4; Philadelphia, D5.

Strip: Midland, Pa., C11; Waukegan, Cleveland, A5; Carnegie, Pa., S9; McKeesport, Pa., F1; Reading, Pa., C2; Washington, Pa., W2; W. Leechburg, Pa., A3; Bridgeville, Pa., U2; Detroit, M2; Canton-Massillon, O., R3; Harrison, N. J., D3; Youngstown, C3; Sharon, Pa., S1; Butler, Pa., A7; Wallingford, Conn., U3 (plus further conversion extras); W1 (25 pct lb higher); New Bedford, Mass., R6; Gary, U1 (25¢ per lb higher).

Bar: Baltimore, A7; S. Duquesne, Pa., U1; Munhall, Pa., U1; Reading, Pa., C2; Titusville, Pa., U2; Washington, Pa., J2; McKeesport, Pa., U1, F1; Bridgeville, Pa., U2; Dunkirk, N. Y., A3; Massillon, O., R3; S. Chicago, U1; Syracuse, N. Y., C11; Watervliet, N. Y., A3; Waukegan, A3; Canton, O., T3; Ft. Wayne, J4; Philadelphia, D5; Detroit, R5; Gary, U1.

Wire: Waukegan, A3; Massillon, O., R3; McKeesport, Pa., F1; Ft. Wayne, J4; Harrison, N. J., D3; Baltimore, A7; Dunkirk, A3 (25¢ per lb lower on Types 301, 303 and 316); Monessen, P1; Syracuse, C11 (25¢ per lb lower on Type 301, 304, and 304); Bridgeville, U2.

Structurals: Baltimore, A7; Massillon, O., R3; Chicago, Ill., J4; Watervliet, N. Y., A3; Syracuse, C11; S. Chicago, U1.

Plates: Brackenridge, Pa., A3; Chicago, U1; Munhall, Pa., U1; Midland, Pa., C11; New Castle, Ind., I2; Middletown, A7; Washington, Pa., J2; Cleveland, Massillon, R3; Coatesville, Pa., C13; Philadelphia, D5; Vandergrift, Pa., U1; Gary, U1.

Forgings: Midland, Pa., C11; Baltimore, A7; Washington, Pa., J2; McKeesport, F1; Massillon, Canton, O., R3; Watervliet, A3; Pittsburgh, Chicago, U1; Syracuse, C11; Detroit, R5; Munhall, Pa., S. Chicago, U1.

Railroad Grades Take Jump

Greatest strength is in railroad scrap . . . No. 1 steelmaking grades hold to present levels . . . West Coast fears export may cause real scrap shortage there.

♦ RAILROAD GRADES have taken over as the strong area of a scrap market at still record strength. Some isolated cases of increases in No. 1 steelmaking grades occurred, but consensus was that a leveling off period is ahead.

In contrast, railroad grades, railroad specialties and reroller rails registered significant increases in most markets, but particularly in the Midwest. Prices of reroller rails of \$87 were quoted, while some sales as high as \$95 were widely, and perhaps wildly, rumored. Rerollers themselves were crying that they were being priced out of business.

Some of the heat in openhearth grades may expire with increased generation of auto scrap on the way. With new model production at full speed, prime auto scrap will soon be coming to the mills in much greater supply.

On the West Coast, export to Japan continues to mount, with foundries feeling a serious shortage at the moment. Some 335,000 tons of scrap are scheduled for Japan from West Coast ports in the fourth quarter. Mills and foundries in the West are worried about the price prospect and a possible shortage. For the moment, Coast scrap is flowing in sufficient supply.

Only sign of real weakness appears in the Ohio River valley, where local conditions may lead to a decline.

Pittsburgh . . . Prices of openhearth scrap continue unchanged. Lack of new mill activity is bringing talk of weakness. One mill has been out of the market for over two months; another bought only a small tonnage last month. Many brokers feel the

next purchase may be at reduced figures. But others say prices will hold or advance, particularly if more than one mill comes into the market soon. Railroad specialties have advanced \$1. Price of low phos is being maintained by small, steady buying.

Chicago . . . Sparked by at least two major purchases, most steelmaking grades in the area moved up \$1. The market continued to show strength in all grades. The situation appears particularly tight in reroller grades, rail and axle, but the entire list is strong and a further advance in some industrial grades is expected. Prices of factory bundles and low phos punchings and plate were incorrectly listed in Sept. 13 issue. Correct price for factory bundles was \$65 to \$67; for low phos, \$69 to \$70.

Philadelphia . . . Except for railroad specialties, this market is holding the price line. Scrap is moving in heavy volume now. But with mills continuing to resist, some dealers are expecting a downward adjustment by next week. Export prices were down \$1 and dealers are finding bundles hard to move at current prices. In spite of evidence of softening, the market is not expected to take any big dips.

New York . . . There were no price changes this week, but this is not an indication of any weakness. Dealers report that deliveries are holding up well, and that scrap generation is continuing to improve. Every piece of equipment in the yards is operating. Export demand continues to be good, keeping the pressure on the mills which might be holding off hoping for a price sag.

Detroit . . . The market is marking time in anticipation of October auto lists, which won't close until next week. Indications are that prices may be lower, but No. 1 grades will

still bring more than \$60. With auto production scheduled to roll in earnest, the shortage of scrap is expected to ease considerably.

Cleveland . . . One small purchase of foundry scrap by a mill out of the market for some time was the only significant activity in a slow week. Two-ft cut structurals and plate sold for \$67. Rails are also going for up to \$85 for 18-in. sizes. Two boat loads of factory bundles totaling 10,000 tons are being brought in from Michigan by a local mill.

Birmingham . . . The South's largest purchaser of openhearth grades continues out of the markets, and with shipments held up on its latest purchase. But an Atlanta mill returned to the market this week, increasing the price of No. 2 heavy melting \$3 there and brokers expect fair movement on this basis. Export prices are higher and domestic prices are not reaching into exporters' territory.

St. Louis . . . Rerolling rails continue to be in very short supply in this area, advancing sharply in price to \$87 to \$88. Prices of No. 1 heavy melting and No. 1 bundles were incorrectly quoted in Sept. 13 issue. No. 1 heavy melting should have been \$52 to \$53; No. 1 bundles \$55 to \$56.

Cincinnati . . . The market is very slow and a modest price drop is expected. Secondary grades are down \$1 while a strengthening foundry market brought up the price of cupola cast. Most dealers are willing to sell off inventory against a possible decline.

Buffalo . . . Railroad grades continue to show outstanding strength in this market. In addition, prices of No. 2 steelmaking grades advanced on the basis of buys by the area's largest mill.

Boston . . . Exports have declined and the market is now localized to a great extent. No. 1 grades held to price levels on the basis of scattered sales at quoted prices. Turnings strengthened as eastern Pennsylvania mills came into the market.

West Coast . . . Prices may have reached their limits. Mills say they are getting enough to meet their demands, but foundries claim their supply is in deplorable shape. Some 335,000 tons of scrap are scheduled for Japan in the fourth quarter.

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To bring added efficiency and economy to your scrap handling operations, investigate the many advantages offered you by a Bucyrus-Erie 22-B crane. To meet your needs most exactly, three types are offered—the crawler-mounted standard and heavy-duty machines, and the carrier-mounted Transit Crane.

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Scrap Prices (Effective Sept. 18, 1956)

Pittsburgh

| | |
|--------------------------|--------------------|
| No. 1 hvy. melting | \$58.00 to \$59.00 |
| No. 2 hvy. melting | 51.00 to 52.00 |
| No. 1 bundles | 58.00 to 59.00 |
| No. 2 bundles | 47.00 to 48.00 |
| Machine shop turn. | 38.00 to 39.00 |
| Mixed bor. and ms. turn. | 38.00 to 39.00 |
| Shoveling turnings | 42.00 to 43.00 |
| Cast iron borings | 42.00 to 43.00 |
| Low phos. punch'g plate | 67.00 to 68.00 |
| Heavy turnings | 54.00 to 55.00 |
| No. 1 RR hvy. melting | 67.00 to 68.00 |
| Scrap rails, random lgth | 77.00 to 78.00 |
| Rails 2 ft and under | 81.00 to 82.00 |
| RR steel wheels | 74.00 to 75.00 |
| RR spring steel | 74.00 to 75.00 |
| RR couplers and knuckles | 74.00 to 75.00 |
| No. 1 machinery cast. | 60.00 to 61.00 |
| Cupola cast. | 53.00 to 54.00 |
| Heavy breakable cast. | 51.00 to 52.00 |

Chicago

| | |
|----------------------------|--------------------|
| No. 1 hvy. melting | \$59.00 to \$60.00 |
| No. 2 hvy. melting | 49.00 to 50.00 |
| No. 1 factory bundles | 65.00 to 67.00 |
| No. 1 dealers' bundles | 59.00 to 60.00 |
| No. 2 dealers' bundles | 45.00 to 46.00 |
| Machine shop turn. | 37.00 to 38.00 |
| Mixed bor. and turn. | 38.00 to 39.00 |
| Shoveling turnings | 38.00 to 39.00 |
| Cast iron borings | 38.00 to 39.00 |
| Low phos. forge crops | 73.00 to 74.00 |
| Low phos. punch'g plate | 70.00 to 71.00 |
| Low phos. 3 ft and under | 68.00 to 69.00 |
| No. 1 RR hvy. melting | 65.00 to 66.00 |
| Scrap rails, random lgth. | 75.00 to 76.00 |
| Re-rolling rails | 86.00 to 87.00 |
| Rails 2 ft and under | 84.00 to 85.00 |
| Locomotive tires, cut | 70.00 to 71.00 |
| Cut bolsters & side frames | 70.00 to 71.00 |
| Angles and splice bars | 75.00 to 76.00 |
| RR steel car axles | 89.00 to 90.00 |
| RR couplers and knuckles | 69.00 to 70.00 |
| No. 1 machine cast. | 59.00 to 61.00 |
| Cupola cast. | 55.00 to 56.00 |
| Heavy breakable cast. | 48.00 to 50.00 |
| Cast iron brake shoes | 49.00 to 51.00 |
| Cast iron wheel | 60.00 to 61.00 |
| Malleable | 72.00 to 73.00 |
| Stove plate | 50.00 to 51.00 |
| Steel car wheels | 70.00 to 72.00 |

Philadelphia Area

| | |
|--------------------------|--------------------|
| No. 1 hvy. melting | \$58.00 to \$59.00 |
| No. 2 hvy. melting | 49.00 to 50.00 |
| No. 1 bundles | 58.00 to 59.00 |
| No. 2 bundles | 47.00 to 48.00 |
| Machine shop turn. | 40.00 to 41.00 |
| Mixed bor. short turn. | 40.00 to 41.00 |
| Cast iron borings | 40.00 to 41.00 |
| Shoveling turnings | 44.00 to 45.00 |
| Clean cast chem. borings | 46.00 to 47.00 |
| Low phos. 5 ft and under | 61.00 to 62.00 |
| Low phos. 3 ft and under | 62.00 to 63.00 |
| Low phos. punch'g | 62.00 to 63.00 |
| Elec. furnace bundles | 60.00 to 61.00 |
| Heavy turnings | 54.00 to 55.00 |
| RR steel wheels | 69.00 to 70.00 |
| RR spring steel | 69.00 to 70.00 |
| Rails 18 in. and under | 76.00 to 77.00 |
| Cupola cast. | 55.00 to 56.00 |
| Heavy breakable cast. | 56.00 to 57.00 |
| Cast iron car wheels | 64.00 to 65.00 |
| Malleable | 68.00 to 69.00 |
| Unstripped motor blocks | 44.00 to 45.00 |
| No. 1 machinery cast. | 57.00 to 59.00 |

Cleveland

| | |
|-------------------------------------|--------------------|
| No. 1 hvy. melting | \$62.50 to \$63.50 |
| No. 2 hvy. melting | 47.00 to 48.00 |
| No. 1 bundles | 62.50 to 63.50 |
| No. 2 bundles | 40.00 to 41.00 |
| No. 1 busheling | 62.50 to 63.50 |
| Machine shop turn. | 33.00 to 34.00 |
| Mixed bor. and turn. | 38.50 to 39.50 |
| Shoveling turnings | 38.50 to 39.50 |
| Cast iron borings | 38.50 to 39.50 |
| Cut struct'l & plates, 2 ft & under | 66.00 to 67.00 |
| Drop forge flashings | 62.50 to 63.50 |
| Low phos. punch'g, plate | 63.50 to 64.50 |
| Foundry steel, 2 ft & under | 56.00 to 57.00 |
| No. 1 RR heavy melting | 65.00 to 67.00 |
| Rails 2 ft and under | 83.00 to 84.00 |
| Rails 18 in. and under | 84.00 to 85.00 |
| Railroad grate bars | 47.00 to 48.00 |
| Steel axle turnings | 44.00 to 45.00 |
| Railroad cast. | 60.00 to 61.00 |
| No. 1 machinery cast. | 57.00 to 58.00 |
| Stove plate | 54.00 to 55.00 |
| Malleable | 70.00 to 71.00 |

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Youngstown

| | |
|--------------------|--------------------|
| No. 1 hvy. melting | \$65.00 to \$66.00 |
| No. 2 hvy. melting | 50.00 to 51.00 |
| No. 1 bundles | 65.00 to 66.00 |
| No. 2 bundles | 45.00 to 46.00 |
| Machine shop turn. | 34.00 to 35.00 |
| Shoveling turnings | 40.00 to 41.00 |
| Cast iron borings | 40.00 to 41.00 |
| Low phos. plate | 66.00 to 67.00 |

Buffalo

| | |
|---------------------------|--------------------|
| No. 1 hvy melting | \$54.00 to \$55.00 |
| No. 2 hvy. melting | 45.00 to 46.00 |
| No. 1 busheling | 54.00 to 55.00 |
| No. 1 bundles | 54.00 to 55.00 |
| No. 2 bundles | 42.00 to 43.00 |
| Machine shop turn. | 30.00 to 31.00 |
| Mixed bor. and turn. | 32.00 to 33.00 |
| Shoveling turnings | 34.00 to 35.00 |
| Cast iron borings | 32.00 to 33.00 |
| Low phos. plate | 59.00 to 60.00 |
| Scrap rails, random lgth. | 57.00 to 58.00 |
| Rails 2 ft and under | 77.00 to 78.00 |
| RR steel wheels | 60.00 to 61.00 |
| RR spring steel | 60.00 to 61.00 |
| RR couplers and knuckles | 70.00 to 71.00 |
| No. 1 machinery cast. | 52.00 to 53.00 |
| No. 1 cupola cast. | 48.00 to 49.00 |

Detroit

| | |
|---|--------------------|
| Brokers buying prices per gross ton, on cars: | |
| No. 1 hvy. melting | \$55.00 to \$56.00 |
| No. 2 hvy. melting | 42.00 to 43.00 |
| No. 1 bundles, openhearth | 56.00 to 57.00 |
| No. 2 bundles | 37.00 to 38.00 |
| New busheling | 55.00 to 56.00 |
| Drop forge flashings | 54.50 to 55.50 |
| Machine shop turn. | 29.00 to 30.00 |
| Mixed bor. and turn. | 32.00 to 33.00 |
| Shoveling turnings | 32.00 to 33.00 |
| Cast iron borings | 32.00 to 33.00 |
| Low phos. punch'g, plate | 55.00 to 56.00 |
| No. 1 cupola cast. | 51.00 to 52.00 |
| Heavy breakable cast. | 44.00 to 45.00 |
| Stove plate | 45.00 to 46.00 |
| Automotive cast. | 54.00 to 55.00 |

St. Louis

| | |
|-------------------------|--------------------|
| No. 1 hvy. melting | \$52.00 to \$53.00 |
| No. 2 hvy. melting | 45.00 to 46.00 |
| No. 1 bundles | 55.00 to 56.00 |
| No. 2 bundles | 41.00 to 42.00 |
| Machine shop turn. | 36.00 to 37.00 |
| Cast iron borings | 37.00 to 38.00 |
| Shoveling turnings | 38.00 to 39.00 |
| No. 1 RR hvy. melting | 62.50 to 63.50 |
| Rails, random lengths | 75.00 to 76.00 |
| Rails 18 in. and under | 79.00 to 80.00 |
| Locomotive tires uncut | 65.00 to 66.00 |
| Angles and splice bars | 68.00 to 69.00 |
| Std. steel car axles | 80.00 to 81.00 |
| RR specialties | 68.00 to 69.00 |
| Cupola cast. | 54.00 to 55.00 |
| Heavy breakable cast. | 45.00 to 46.00 |
| Cast iron brake shoes | 50.00 to 51.00 |
| Stove plate | 48.00 to 49.00 |
| Cast iron car wheels | 55.00 to 56.00 |
| Re-rolling rails | 87.00 to 88.00 |
| Unstripped motor blocks | 44.00 to 45.00 |

Boston

| | |
|---|--------------------|
| Brokers buying prices per gross ton, on cars: | |
| No. 1 hvy. melting | \$50.50 to \$51.50 |
| No. 2 hvy. melting | 39.00 to 40.00 |
| No. 1 bundles | 50.50 to 51.50 |
| No. 2 bundles | 36.00 to 37.00 |
| No. 1 busheling | 49.50 to 50.50 |
| Elec. furnace, 3 ft & under | 53.00 to 54.00 |
| Machine shop turn. | 30.00 to 31.00 |
| Mixed bor. and short turn. | 30.00 to 31.00 |
| Shoveling turnings | 34.00 to 35.00 |
| Clean cast chem. borings | 34.00 to 35.00 |
| No. 1 machinery cast. | 45.00 to 46.00 |
| Mixed cupola cast. | 41.00 to 42.00 |
| Heavy breakable cast. | 44.00 to 45.00 |
| Stove plate | 39.00 to 40.00 |
| Unstripped motor blocks | 32.00 to 33.00 |

New York

| | |
|---|--------------------|
| Brokers buying prices per gross ton, on cars: | |
| No. 1 hvy. melting | \$53.00 to \$54.00 |
| No. 2 hvy. melting | 44.00 to 45.00 |
| No. 1 bundles | 40.00 to 41.00 |
| No. 2 bundles | 32.00 to 33.00 |
| Machine shop turn. | 32.00 to 33.00 |
| Mixed bor. and turn. | 32.00 to 33.00 |
| Shoveling turnings | 37.00 to 38.00 |
| Clean cast chem. borings | 35.00 to 36.00 |
| No. 1 machinery cast. | 52.00 to 53.00 |
| Mixed yard cast. | 48.00 to 49.00 |
| Charging box cast. | 48.00 to 49.00 |
| Heavy breakable cast. | 48.00 to 49.00 |
| Unstripped motor blocks | 38.00 to 39.00 |

Birmingham

| | |
|-----------------------------|--------------------|
| No. 1 hvy. melting | \$42.00 to \$43.00 |
| No. 2 hvy. melting | 40.00 to 41.00 |
| No. 1 bundles | 42.00 to 43.00 |
| No. 2 bundles | 34.00 to 35.00 |
| No. 1 busheling | 42.00 to 43.00 |
| Machine shop turn. | 30.50 to 31.50 |
| Shoveling turnings | 32.50 to 33.50 |
| Cast iron borings | 30.50 to 31.50 |
| Electric furnace bundles | 53.00 to 54.00 |
| Bar crops and plate | 58.00 to 59.00 |
| Structural and plate, 2 ft. | 57.00 to 58.00 |
| No. 1 RR hvy. melting | 50.00 to 51.00 |
| Scrap rails, random lgth. | 65.00 to 66.00 |
| Rails, 18 in. and under | 71.00 to 72.00 |
| Angles & splice bars | 64.00 to 65.00 |
| Re-rolling rails | 72.00 to 73.00 |
| No. 1 cupola cast. | 57.00 to 58.00 |
| Stove plate | 49.00 to 50.00 |
| Charging box cast. | 40.00 to 41.00 |
| Cast iron car wheels | 43.00 to 44.00 |
| Unstripped motor blocks | 44.00 to 45.00 |
| Mashed tin cans | 15.00 to 16.00 |

Cincinnati

| | |
|---|--------------------|
| Brokers buying prices per gross ton, on cars: | |
| No. 1 hvy. melting | \$57.00 to \$58.00 |
| No. 2 hvy. melting | 46.00 to 47.00 |
| No. 1 bundles | 57.00 to 58.00 |
| No. 2 bundles | 42.00 to 43.00 |
| Machine shop turn. | 37.00 to 38.00 |
| Mixed bor. and turn. | 40.00 to 41.00 |
| Shoveling turnings | 39.00 to 40.00 |
| Cast iron borings | 39.00 to 40.00 |
| Low phos. 18 in. & under | 62.00 to 63.00 |
| Rails, random lengths | 69.00 to 70.00 |
| Rails, 18 in. and under | 78.00 to 79.00 |
| No. 1 cupola cast. | 48.00 to 49.00 |
| Hvy. breakable cast. | 47.00 to 48.00 |
| Drop broken cast. | 58.00 to 59.00 |

San Francisco

| | |
|-----------------------|---------|
| No. 1 hvy. melting | \$50.00 |
| No. 2 hvy. melting | 47.00 |
| No. 1 bundles | 48.00 |
| No. 2 bundles | 42.00 |
| No. 3 bundles | 29.00 |
| Machine shop turn. | 30.00 |
| Cast iron borings | 30.00 |
| No. 1 RR hvy. melting | 50.00 |
| No. 1 cupola cast. | 55.00 |

Los Angeles

| | |
|----------------------------|---------|
| No. 1 hvy. melting | \$50.00 |
| No. 2 hvy. melting | 47.00 |
| No. 1 bundles | 48.00 |
| No. 2 bundles | 42.00 |
| No. 3 bundles | 30.00 |
| Machine shop turn. | 30.00 |
| Shoveling turnings | 33.00 |
| Cast iron borings | 30.00 |
| Elec. furn. 1 ft and under | 51.00 |
| No. 1 RR hvy. melting | 50.00 |
| No. 1 cupola cast. | 52.00 |

Seattle

| | |
|--------------------|---------|
| No. 1 hvy. melting | \$50.00 |
| No. 2 hvy. melting | 46.00 |
| No. 2 bundles | 41.00 |
| No. 3 bundles | 27.00 |
| No. 1 cupola cast. | 48.00 |
| Mixed yard cast. | 48.00 |

Hamilton, Ont.

| | |
|---------------------------|---------|
| No. 1 hvy. melting | \$52.00 |
| No. 2 hvy. melting | 47.00 |
| No. 1 bundles | 52.00 |
| No. 2 bundles | 42.50 |
| Mixed steel scrap | 46.00 |
| Bushings | 39.50 |
| Bush., new fact. prep'd. | 50.00 |
| Bush., new fact. unprep'd | 46.00 |
| Machine shop turn. | 28.00 |
| Short steel turn. | 34.00 |
| Mixed bor. and turn. | 28.00 |
| Rails, re-rolling | 60.00 |
| Cast scrap | 50.00 |



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Copper Supply Catches Up

But the cost is still high . . . Signing of 3-year contracts by major U. S. producers assures users of a fairly stable market . . . Suez strengthens London prices.

♦ THE COPPER INSTITUTE statistics for mining, refining and deliveries during the month of August indicate that price is currently the only gripe of consumers. Both production and deliveries were up to a point where supply is at least equal to the demand.

Production of crude copper from primary domestic sources in August was up about 6000 tons over the previous month to 90,858 tons. Foreign crude production was also up, but only 1100 tons to 149,530 tons. Total world output was 240,388 tons up from 233,182 tons produced in July.

World refinery output was up slightly to 242,319 tons. But all of the gain was registered outside the U. S. since domestic refineries production fell off slightly. The 5000 ton increase overseas was able to offset the 3300-ton domestic decrease.

Of more immediate interest to consumers is the fact that deliveries in the U. S. in August were up 12,400 tons over the previous month, to 110,128 tons.

Outlook for the immediate future is good since stock on hand at U. S. refineries rose over 8500 tons to 96,450 tons. And stocks on hand at foreign refineries were up 3512 tons to 218,793 tons.

It looks like peace and production

will continue to reign in U. S. installations because of the 3-year contracts signed by just about all major companies and unions. Reports from the Chilean installations of U. S. subsidiaries are bright. Anaconda plant at Chuquibambilla reported average monthly production during the second quarter was 19,500 metric tons, compared to 18,000 the first quarter. At Potrerillos second quarter monthly production average was also up from the previous period, 3450 from 3100. The Kennecott installation at El Teniente followed the trend by boosting average monthly production during the second quarter to 14,000 metric tons from 12,350 turned out per month in the first quarter.

Pressure for a lower U. S. primary producers price has been eased temporarily. Strike in N. Rhodesia and the seizure of the Suez Canal has strengthened the London Metals Exchange market, principal competitor of U. S. open market for pivotal foreign copper. Buying has stepped up considerably, especially since the Canal incident. However, it is understood that the British government will sell 36,000 tons of copper during a six month period beginning this month. The crown insists that it will be done quietly and judi-

ciously so as not to affect market conditions more than is necessary. However this might tend to short-stop the upward trend of the London price and renew the pressure for a lower U. S. producers price.

ALUMINUM . . . Donald E. Browne, vice president and treasurer of Kaiser Aluminum & Chemical Corp. had something to say about the future of aluminum in a speech delivered in Houston, Tex., last week.

Initially, Mr. Browne predicts that by 1965 total aluminum consumption in the U. S. will have doubled—to over 4 million tons annually.

Here's how Mr. Browne and Kaiser see the situation, market by market:

Automotive—By 1965 the average car will contain 95 lb of aluminum. Over and above this figure there is a 125 lb-per-car potential companies can sell the automakers on making doors, hoods and rear deck lids of aluminum.

Electrical industry—will double in the next 10 years, and aluminum is expected to double its market penetration. The combination would result in the use of four times as much aluminum as is presently consumed.

Construction—Consumption of aluminum for windows and doors for residential buildings now totals 170,000 tons per year. This is expected to be about 380,000 tons by 1965.

Potential of aluminum in school construction is considered top drawer. With 65,000 schoolrooms being built per year during the next decade, Kaiser estimates over 500,000 tons of aluminum per year will be required. Curtain walls and building panels are expected to consume about 65,000 tons per year by 1965.

NICKEL . . . The National Assn. of Purchasing Agents reports that demand for nickel is at an all time high. They say that much of the metal available is still at "prohibitive cost."

Slowdown in automotive and appliance production had little real effect on supply and demand because of increased requirements.

It appears that nickel is the answer to the problem of disposing of atomic wastes, says NAPA. The addition of nickel ferrocyanide to the liquid wastes precipitates radioactive cesium into a sludge which leaves less volume for disposal, since the resulting liquid is relatively harmless.

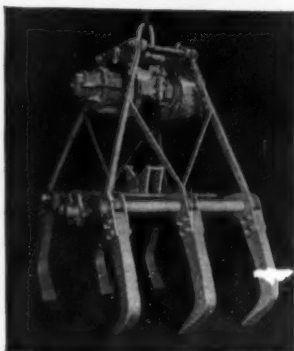
Daily Nonferrous Metal Prices

(Cents per lb except as noted)

| | Sept. 12 | Sept. 13 | Sept. 14 | Sept. 15 | Sept. 17 | Sept. 18 |
|-------------------------|----------|----------|----------|----------|----------|----------|
| Copper, electro, Conn. | 40.00 | 40.00 | 40.00 | 40.00 | 40.00 | 40.00 |
| Copper, Lake, delivered | 40.00 | 40.00 | 40.00 | 40.00 | 40.00 | 40.00 |
| Tin, Straits, New York | 104.125 | 107.00 | 107.375 | .... | 106.25 | 106.00* |
| Zinc, East St. Louis | 13.50 | 13.50 | 13.50 | 13.50 | 13.50 | 13.50 |
| Lead, St. Louis | 15.80 | 15.80 | 15.80 | 15.80 | 15.80 | 15.80 |

Note: Quotations are going prices.

*Tentative



*So powerful this grapple
handles 10 tons hot steel
billets at every grab*

● Strong, sturdy, this Hayward Grapple is relied on by a large steel company to transfer hot steel billets at 1800° F from racks to loading cars. It is built so powerful it can handle up to 10 tons at every grab. The Hayward Company, 50 Church St., New York 7, N. Y.

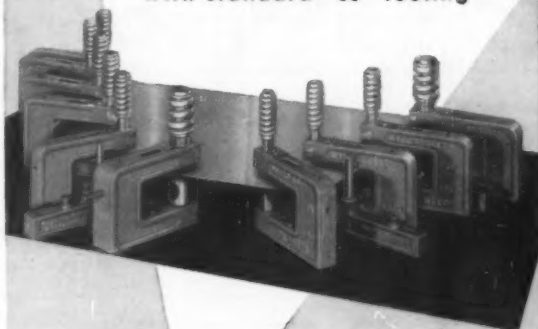
HAYWARD BUCKETS

CLAM SHELL • ELECTRIC • ORANGE PEEL • GRAPPLES
famous for performance since 1888

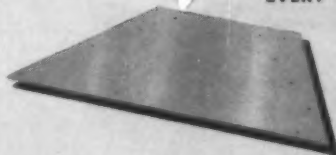
6 minutes . . . 45 seconds
and this ten hole

WALES PUNCH SET-UP

WAS READY TO ROLL
with standard "CJ" tooling



HERE'S THE RESULT
EVERY 12 SECONDS



. . . and any good mechanic can make a similar set-up in a matter of minutes. WALES standardized punching units are completely self-contained . . . punches and dies are permanently aligned . . . nothing attached to press ram. They will always save hours . . . and often DAYS in set-up time.

Rugged type CJ units will punch holes up to 1 1/4" diameter in material up to 1/4" thick . . . unlimited straight line, scattered and staggered, round or shaped hole punching patterns. Die retention design features rapid die change WITHOUT REMOVING DIE from set-up . . . provides controlled slug ejection.

No "dead storage" the WALES WAY! The same group of units can be used over and over again in other patterns.

Get this time-saving, money-saving story. Write for fully illustrated, fact filled catalog NOW!

Send for BULLETIN No. 26-H

Illustrated with actual job work and full of interesting data and suggestions that you can adopt for your shop.

WALES *Strippit* COMPANY

"...the Wales-Way is the PLUS-PROFIT way"

345 PAYNE AVE. — North Tonawanda, N.Y.

WALES-STRIPPIT OF CANADA LTD., HAMILTON, ONT.

FREE
BOOKLET



... tells how
diamond abrasive
assures better
metallographic
specimens.

ELGIN DIAMOND

... for dependable
metallographic specimens, faster

Precision graded Elgin Diamond assures a consistent surface for examination and saves time in polishing metallographic specimens. Precision graded diamond particles cut clean, eliminate "smearing", preserve grain boundaries. Count on Elgin Diamond for uniform polishing results in all diamond abrasive applications . . . it's the standard for industrial diamond abrasive quality. Write today for this booklet on "Metallographic Polishing With Diamond."

ABRASIVES DIVISION, DEPT. B

ELGIN NATIONAL WATCH COMPANY

ELGIN, ILLINOIS

Nonferrous Prices (Effective Sept. 18, 1956)

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate ("F" temper except 6061-0)

| Alloy | .032 | .061 | .136- .249 | .250- 3 |
|--------------------------|------|------|---------------|------------|
| 1999, 1100, 3003..... | 44.3 | 42.1 | 40.9 | 40.3 |
| 5052..... | 51.8 | 46.8 | 45.1 | 43.9 |
| 6061-0..... | 48.9 | 44.6 | 43.8 | 43.6 |

Extruded Solid Shapes

| Factor | 6063 T-5 | 6063 T-6 |
|------------|-----------|------------|
| 6-8..... | 45.5-47.8 | 61.8-65.1 |
| 12-14..... | 46.2-47.7 | 62.2-66.8 |
| 24-26..... | 49.4-49.6 | 73.1-77.8 |
| 35-38..... | 58.3-59.6 | 97.4-101.6 |

Screw Machine Stock—2011-T-3

| Size* | 3/4 | 3/8-3/4 | 3/4-1 | 1 1/4-1 3/4 |
|-------|------|---------|-------|-------------|
| Price | 59.7 | 58.8 | 57.4 | 55.2 |

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

| Length*→ | 72 | 96 | 120 | 144 |
|----------------|---------|---------|---------|---------|
| .019 gage..... | \$1.352 | \$1.893 | \$2.254 | \$2.704 |
| .024 gage..... | 1.686 | 2.252 | 2.815 | 3.578 |

MAGNESIUM

(f.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

| Type→ | Gage→ | .250- 3.00 | .250- 3.00 | .188 | .081 | .039 |
|----------------------------|-------|---------------|---------------|-------|-------|------|
| AZ31B Stand, Grade..... | | 67.9 | 69.0 | 77.9 | 108.1 | |
| AZ31B Spec. | | 98.3 | 96.7 | 108.7 | 171.9 | |
| Tread Plate | | 70.6 | 71.7 | | | |
| Tooling Plate | 73.0 | | | | | |

Extruded Shapes

| Factor→ | 6-8 | 12-14 | 24-26 | 35-38 |
|-----------------------------|------|-------|-------|-------|
| Comm. Grade (AZ31C)..... | 69.6 | 70.7 | 75.6 | 89.3 |
| Spec. Grade (AZ31B)..... | 84.6 | 85.7 | 90.6 | 104.3 |

Alloy Ingot

AZ91B (Die Casting)..... 37.25 (delivered);
AZ93A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

| | "A" Nickel | Monel | Inconel |
|--------------------|------------|-------|---------|
| Sheet, CR..... | 113 | 97 | 118 |
| Strip, CR..... | 111 | 99 | 128 |
| Rod, Bar, HR..... | 94 | 80 | 99 |
| Angles, HR..... | 94 | 80 | 99 |
| Plate, HR..... | 107 | 96 | 111 |
| Seamless tube..... | 144 | 120 | 190 |
| Shot, blocks..... | 78 | | |

COPPER, BRASS, BRONZE

(Freight included on 500 lbs)

| | Sheet | Wire | Rod | Tube |
|-------------------|-------|-------|-------|-------|
| Copper..... | 61.63 | | | 61.82 |
| Brass, 70/30..... | 52.10 | 52.64 | | 55.01 |
| Brass, Low..... | 55.85 | 56.39 | 55.75 | 58.06 |
| Brass, R L..... | 57.19 | 57.73 | 57.13 | 60.00 |
| Brass, Naval..... | 55.72 | | 50.03 | 58.88 |
| Monel Metal..... | 53.84 | 47.85 | 49.65 | |
| Comm. Br..... | 59.08 | 59.62 | 59.02 | 61.64 |
| Mang. Br..... | 59.46 | | 53.56 | |
| Phos. Br. 3%..... | 79.58 | | 80.08 | |

TITANIUM

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, \$12.10-
\$12.60; alloy, \$15.00-\$15.75; Plate, HR, com-
mercially pure, \$10.00-\$10.50; alloy, \$11.50-
\$12.00. Wire, rolled and/or drawn, commerci-
ally pure, \$9.00-\$11.50; alloy, \$11.50; Bar, HR
or forged, commercially pure, \$7.55-\$7.80; alloy,
\$7.55-\$7.75.

PRIMARY METAL

(Cents per lb, unless otherwise noted)

| | |
|---|------------------|
| Aluminum ingot, 99+%, 10,000 lb. freight allowed..... | 27.10 |
| Aluminum pig..... | 25.00 |
| Antimony, American, Laredo, Tex..... | 33.50 |
| Beryllium copper, per lb conta'd Be..... | 43.00 |
| Beryllium aluminum 5% Be, Dollars per lb contained Be..... | \$74.75 |
| Bismuth, ton lots..... | \$ 2.25 |
| Cadmium, del'd..... | \$ 1.70 |
| Cobalt, 97-99% (per lb)..... | \$2.60 to \$2.67 |
| Copper, electro, Conn. Valley..... | 40.00 |
| Copper, Lake, delivered..... | 40.00 |
| Gold, U. S. Treas., per troy oz..... | \$35.00 |
| Indium, 99.9% dollars per troy oz..... | \$ 2.25 |
| Iridium, dollars per troy oz..... | \$90 to \$100 |
| Lead, St. Louis..... | 15.80 |
| Lead, New York..... | 16.00 |
| Magnesium, 99.8+%, f.o.b. Velasco, Tex., 10,000 lb, pig..... | 35.25 |
| Ingot..... | 36.00 |
| Magnesium, sticks, 100 to 500 lb..... | 59.00 |
| Mercury, dollars per 76-lb flask..... | |
| f.o.b. New York..... | \$255 to \$257 |
| Nickel electro..... | 64.50 |
| Nickel oxide sinter at Copper Cliff, Ont., contained nickel..... | 60.75 |
| Palladium, dollars per troy oz..... | \$23 to \$24 |
| Platinum, dollars per troy oz..... | \$103 to \$105 |
| Silver, New York, cents per troy oz..... | 90.75 |
| Tin, New York..... | 106.00* |
| Titanium sponge, grade A-1, \$2.70 to \$3.00 Zinc, East St. Louis..... | 13.50 |
| Zinc, New York..... | 14.00 |
| Zirconium sponge..... | \$10.00 |

*Tentative.

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

| | |
|-----------------------|-------|
| 85-5-5 ingot..... | |
| No. 115..... | 37.75 |
| No. 120..... | 36.50 |
| No. 123..... | 35.00 |
| 80-10-10 ingot..... | |
| No. 305..... | 41.00 |
| No. 315..... | 39.25 |
| 88-10-2 ingot..... | |
| No. 210..... | 52.75 |
| No. 215..... | 48.50 |
| No. 245..... | 43.50 |
| Yellow ingot..... | |
| No. 405..... | 29.75 |
| Manganese bronze..... | |
| No. 421..... | 33.00 |

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

| | |
|-----------------------------------|-------------|
| 95-5 aluminum-silicon alloys..... | |
| 0.30 copper max..... | 28.25-29.00 |
| 0.80 copper max..... | 28.00-28.75 |
| Piston alloys (No. 122 type)..... | 27.75-28.50 |
| No. 12 alum. (No. 2 grade)..... | 26.25-27.00 |
| 108 alloy..... | 26.50-27.00 |
| 195 alloy..... | 27.50-28.50 |
| 13 alloy (0.60 copper max.)..... | 28.00-28.75 |
| AXS-679..... | 26.50-27.00 |

Steel deoxidizing aluminum, notch bar granulated or shot

| | |
|-------------------------|-------------|
| Grade 1—95-97 1/4%..... | 26.50-27.00 |
| Grade 2—92-95%..... | 25.50-26.00 |
| Grade 3—90-92%..... | 24.50-25.00 |
| Grade 4—85-90%..... | 24.00-24.50 |

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for
shipments of 20,000 lb and over)

| | Heavy | Turnings |
|----------------------------|--------|----------|
| Copper..... | 36 | 35 1/4 |
| Yellow brass..... | 27 1/4 | 25 1/4 |
| Red brass..... | 31 1/4 | 31 1/4 |
| Comm. bronze..... | 33 1/4 | 32 1/4 |
| Mang. bronze..... | 25 1/4 | 24 1/4 |
| Yellow brass rod ends..... | 27 | |

Custom Smelters Scrap

(Cents per pound carload lots, delivered
to refinery)

| | |
|------------------------|--------|
| No. 1 copper wire..... | 34 |
| No. 2 copper wire..... | 32 1/2 |
| Light copper..... | 30 1/2 |
| *Refinery brass..... | 30 1/2 |

* Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered
to refinery)

| | |
|--------------------------------|--------|
| No. 1 copper wire..... | 34 |
| No. 2 copper wire..... | 32 1/2 |
| Light copper..... | 30 |
| No. 1 composition..... | 30 |
| No. 1 comp. turnings..... | 30 |
| Heavy yellow brass solids..... | 20 1/2 |
| Brass pipe..... | 21 1/2 |
| Radiators..... | 23 |

Aluminum

| | |
|--------------------------|-----------------|
| Mixed old cast..... | 18 — 18 1/2 |
| Mixed new clips..... | 18 1/2 — 19 1/2 |
| Mixed turnings, dry..... | 18 — 19 |

Dealers' Scrap

(Dealers' buying price, f.o.b. New York
in cents per pound)

| Copper and Brass | |
|---------------------------------|-----------------|
| No. 1 copper wire..... | 31 — 31 1/2 |
| No. 2 copper wire..... | 28 1/2 — 29 1/2 |
| Light copper..... | 26 1/2 — 27 |
| Auto radiators (unsweated)..... | 19 — 19 1/2 |
| No. 1 composition..... | 25 1/2 — 26 |
| No. 1 composition turnings..... | 24 — 24 1/2 |
| Unlined red car boxes..... | 20 — 21 1/2 |
| Cocks and faucets..... | 19 — 19 1/2 |
| Clean heavy yellow brass..... | 17 — 17 1/2 |
| Brass pipe..... | 20 1/2 — 21 |
| New 1/2 brass clippings..... | 22 1/2 — 23 1/2 |
| No. 1 brass rod turnings..... | 19 1/2 — 20 1/2 |

Aluminum

| | |
|-----------------------------------|-------------|
| Alum. pistons and struts..... | 8 — 8 1/2 |
| Aluminum crankcases..... | 13 — 13 1/2 |
| 1100 (2S) aluminum clippings..... | 16 — 16 1/2 |
| Old sheet and utensils..... | 13 — 13 1/2 |
| Borings and turnings..... | 9 — 9 1/2 |
| Industrial castings..... | 13 — 13 1/2 |
| 2024 (24S) clippings..... | 14 1/2 — 15 |

Zinc

| | |
|-------------------------|---------------|
| New zinc clippings..... | 7 1/2 — 8 |
| Old zinc..... | 4 1/2 — 5 |
| Zinc routings..... | 2 1/2 — 3 |
| Old die cast scrap..... | 2 1/2 — 2 1/2 |

Nickel and Monel

| | |
|-------------------------------------|---------------|
| Pure nickel clippings..... | \$1.85-\$1.95 |
| Clean nickel turnings..... | \$1.55-\$1.65 |
| Nickel anodes..... | \$1.85-\$1.95 |
| Nickel rod ends..... | \$1.85-\$1.95 |
| New Monel clippings..... | 80-90 |
| Clean Monel turnings..... | 70-80 |
| Old sheet Monel..... | 70-80 |
| Nickel silver clippings, mixed..... | 21 |
| Nickel silver turnings, mixed..... | 18 |

Lead

| | |
|---------------------------|-------------|
| Soft scrap lead..... | 12 1/2 — 13 |
| Battery plates (dry)..... | 7 — 7 1/2 |
| Batteries, acid free..... | 4 1/2 |

Miscellaneous

| | |
|------------------------------|-----------------|
| Block tin..... | 80 — 81 |
| No. 1 pewter..... | 62 1/2 — 63 |
| Auto babbitt..... | 42 — 42 1/2 |
| Mixed common babbitt..... | 13 — 13 1/2 |
| Solder joints..... | 18 — 18 1/2 |
| Siphon tops..... | 42 |
| Small foundry type..... | 15 1/2 — 15 1/2 |
| Monotype..... | 14 1/2 — 14 1/2 |
| Lino. and stereotype..... | 13 — 13 1/2 |
| Electrotype..... | 12 1/2 — 12 1/2 |
| Hand picked type shells..... | 10 — 10 1/2 |
| Lino. and stereo. dross..... | 5 1/2 — 5 1/2 |
| Electro. dross..... | 4 1/2 — 4 1/2 |

IRON AGE

STEEL
PRICES(Effective
Sept. 18, 1956)

Italics identify producers listed in key at end of table. Base prices, f.a.b. mill, in cents per lb., unless otherwise noted. Extras apply.

| | BILLETS, BLOOMS, SLABS | | | PIL- ING | SHAPES STRUCTURALS | | | STRIP | | | | | |
|-------------|--|------------------------------|-----------------------|-----------------------|-----------------------|-------------------------|---------------------------|-----------------|---|------------------------------|------------------------------|-------------------------|--------------------------|
| | Carbon Re-rolling Net Ton | Carbon Forging Net Ton | Alloy Net Ton | | Carbon | Hi Str. Low Alloy | Carbon Wide- Flange | Hot- rolled | Cold- rolled | Hi Str. H.R. Low Alloy | Hi Str. C.R. Low Alloy | Alloy Hot- rolled | Alloy Cold- rolled |
| EAST | Bethlehem, Pa. | | \$107.00 B3 | | 5.05 B3 | 7.40 B3 | 5.05 B3 | | | | | | |
| | Buffalo, N. Y. | \$74.00 B3, R3 | \$91.50 B3, R3 | \$107.00 B3, R3 | 5.90 B3 | 5.05 B3 | 7.40 B3 | 5.05 B3 | 4.675 B3, R3 | 6.85 R7 | 6.95 B3 | | |
| | Claymont, Del. | | | | | | | | | | | | 14.55 C11 |
| | Harrison, N. J. | | | | | | | | | | | | |
| | Conschocken, Pa. | | \$96.50 A2 | \$114.00 A2 | | | | 4.725 A3 | 5.90 A2 | 6.95 A2 | | | |
| | New Bedford, Mass. | | | | | | | | 7.30 R6 | | | | |
| | Johnstown, Pa. | \$74.00 B3 | \$91.50 B3 | \$107.00 B3 | | 5.05 B3 | 7.40 B3 | | | | | | 14.90 T8 |
| | Boston, Mass. | | | | | | | | 7.40 T8 | | | | |
| | New Haven, Conn. | | | | | | | | 7.30 A3 | | | | |
| | Baltimore, Md. | | | | | | | | 6.85 T8 | | | | |
| | Phoenixville, Pa. | | | | 5.85 P2 | | 5.85 P2 | | | | | | |
| | Sparrows Pt., Md. | | | | | | | 4.675 B3 | | 6.95 B3 | | | |
| | Bridgeport, Wallingford, Conn. | \$79.00 N8 | \$96.50 N8 | \$107.00 N8 | | | | | 7.30 W1 6.95 T8 | | | | |
| | Pawtucket, R. I. Worcester, Mass. | | | | | | | | 7.40 A5,N7 | | | | 14.90 N7 |
| MIDDLE WEST | Alton, Ill. | | | | | | | 4.675 L1 | | | | | |
| | Ashland, Ky. | | | | | | | 4.675 A7 | | | | | |
| | Canton-Massillon, Dover, Ohio | | \$94.00 R3 | \$107.00 R3 T3 | | | | | 6.85 G4 | | 10.10 G4 | | 14.55 G4 |
| | Chicago, Ill. Franklin Park, Ill. | \$74.00 U1, R3 | \$91.50 U1, R3,W8 | \$107.00 U1, R3,W8 | 5.90 U1 | 5.00 U1, W8 | 7.35 U1, Y1 6.00 W8 | 5.00 U1 | 4.675 N4 4.675 A1 | 6.95 A1,T8 | | 7.75 W8, S9 | 14.55 A1, S9,T8 |
| | Cleveland, Ohio | | | | | | | | 6.85 A5,J3 | | | 7.75 J3 | |
| | Detroit, Mich. | \$74.00 R5 | | \$107.00 R5 | | | | 4.775 G3, M2 | 6.95 M2,G3, D2,P11 | 7.05 G3 | 10.10 G3, S1,D2 | 7.05 G3 | |
| | Anderson, Ind. | | | | | | | | 6.85 G4 | | 10.10 G4 | | |
| | Duluth, Minn. | | | | | | | | | | | | |
| | Gary, Ind. Harbor, Indiana | \$74.00 U1 | \$91.50 U1 | \$107.00 U1, Y1 | 5.90 I3 | 5.00 U1 | 7.35 U1,I3 | 5.00 I3 | 4.675 U1, I3,Y1 | 6.85 Y1 | 6.95 U1, I3,Y1 | 10.20 Y1 | 7.75 U1, Y1 |
| | Sterling, Ill. | \$74.00 N4 | | | | | | 4.775 N4 | | | | | |
| | Indianapolis, Ind. | | | | | | | | 7.00 C9 | | | | |
| | Newport, Ky. | | | | | | | | | | | 7.75 N5 | |
| | Middletown, Ohio | | | | | | | | | | | | |
| | Niles, Warren, Ohio Sharon, Pa. | | \$91.50 S1, C10 | \$107.00 S1 C10 | | | | 4.675 S1, R3 | 6.85 T4 | 6.95 S1, R3 | 10.00 S1, R3 | 7.75 S1 | 14.55 S1 |
| | Pittsburgh, Pa. Midland, Pa. Butler, Pa. | \$74.00 U1, J3 | \$91.50 U1, J3,C11 | \$107.00 U1, C11 | 5.90 U1 | 5.00 U1, J3 | 7.35 U1, J3 | 5.00 U1 | 4.675 P6 5.750 P6 6.45 J3,B4, S7 | | | 7.75 S9 | 14.55 S9 |
| | Portsmouth, Ohio | | | | | | | | | | | | |
| | Weirton, Wheeling, Follansbee, W. Va. | | | | | 5.00 W3 | | 4.675 W3 | 6.85 W3,P3 | 6.95 W3 | 6.95 W3 | | |
| | Youngstown, Ohio | \$74.00 R3 | \$91.50 Y1, C10 | \$107.00 Y1 | | 5.00 Y1 | 7.35 Y1 | 4.675 U1, Y1 | 6.85 Y1,C3 | 6.95 U1, Y1 | 10.20 Y1 | 7.75 U1, Y1 | |
| WEST | Fontana, Cal. | \$83.50 K1 | \$101.00 K1 | \$128.00 K1 | | 5.70 K1 | 8.05 K1 | 5.85 K1 | 5.475 K1 | 8.00 K1 | | | |
| | Geneva, Utah | \$91.50 C7 | | | | 5.00 C7 | 7.35 C7 | | | | | | |
| | Kansas City, Mo. | | | | | 5.10 S2 | 7.45 S2 | | 4.925 S2 | | 7.20 S2 | | |
| | Los Angeles, Torrance, Cal. | | \$101.00 B2 | \$127.00 B2 | | 5.70 C7, B2 | 8.05 B2 | | 5.425 B2, C7 | 8.00 C1 | | 6.95 B2 | |
| | Minneapolis, Colo. | | | | | 5.30 C6 | | | 5.775 C6 | | | | |
| | Portland, Ore. | | | | | 5.75 O2 | | | | | | | |
| | San Francisco, Niles, Pittsburg, Cal. | | \$101.00 B2 | | | 5.65 B2 | 8.00 B2 | | 5.425 C7,B3 | | | | |
| | Seattle, Wash. | | \$105.00 B2 | | | 5.75 B2 | 8.10 B2 | | 5.675 B2 | | | | |
| | Atlanta, Ga. | | | | | | | | 4.675 A8 | | | | |
| SOUTH | Fairfield, Ala. City, Birmingham, Ala. | \$74.00 T2 | \$91.50 T2 | | | 5.00 T2,R3 5.30 C16 | 7.35 T2 | | 4.675 T2,R3 4.975 C16 | | 6.95 T2 | | |
| | Houston, Lone Star, Texas | | \$96.50 S2 | \$112.00 S2 | | 5.10 S2 | 7.45 S2 | | 4.925 S2 | | 7.20 S2 | | |

IRON AGE

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

**STEEL
PRICES**(Effective
Sept. 18, 1936)

| STEEL PRICES (Effective Sept. 18, 1936) | | SHEETS | | | | | | | | WIRE ROD | TINPLATE† | | BLACK PLATE | |
|--|--|----------------------------|------------------|-------------|------------------|-------------|------------------------|------------------------|-------------------------|-------------------------|--|-------------------------|----------------------------|-----------------------------|
| | | Hot-rolled 18 ga. & heavy. | Cold-rolled | Galvanized | Enamel-ing | Long Terne | Hi Str. Low Alloy H.R. | Hi Str. Low Alloy C.R. | Hi Str. Low Alloy Galv. | Hot-rolled 19 ga. | | Coke* 1.25-lb. base box | Electro* 0.25-lb. base box | Hollowware Enameling 29 ga. |
| EAST | Behlehem, Pa. | | | | | | | | | | | | | |
| | Buffalo, N. Y. | 4.675 B3 | 5.75 B3 | | | | 6.90 B3 | 8.525 B3 | | 5.80 W6 | † Special coated mig-terne deduct 50¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 128 lb. deduct \$2.20 from 1.25 lb. coke base box. * COKE: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add \$1.00. Differ-ential 1.00 lb./0.25 lb. add 65¢. | | | |
| | Claymont, Del. | | | | | | | | | | | | | |
| | Coatesville, Pa. | | | | | | | | | | | | | |
| | Canshohocken, Pa. | 4.725 A2 | 5.80 A2 | | | | 6.95 A2 | | | | | | | |
| | Harrisburg, Pa. | | | | | | | | | | | | | |
| | Hartford, Conn. | | | | | | | | | | | | | |
| | Johantown, Pa. | | | | | | | | | 5.80 B3 | | | | |
| | Fairless, Pa. | 4.725 U1 | 5.80 U1 | | | | 6.95 U1 | 8.575 U1 | | | \$9.70 U1 | \$8.40 U1 | | |
| | New Haven, Conn. | | | | | | | | | | | | | |
| | Phoenixville, Pa. | | | | | | | | | | | | | |
| | Sparrows Pt., Md. | 4.675 B3 | 5.75 B3 | 6.30 B3 | | | 6.90 B3 | 8.575 B3 | 9.275 B3 | 5.90 B3 | \$9.70 B3 | | | |
| Worcester, Mass. | | | | | | | | | 6.10 A5 | | | | | |
| Trenton, N. J. | | | | | | | | | | | | | | |
| MIDDLE WEST | Alton, Ill. | | | | | | | | | 6.00 L1 | | | | |
| | Ashland, Ky. | 4.675 A7 | | 6.30 A7 | 6.325 A7 | | | | | | | | | |
| | Canton-Massillon, Dover, Ohio | | | 6.30 R3, R1 | 6.325 R3 | | | | | | | | | |
| | Chicago, Juliet, Ill. | 4.675 W3, A1 | | | | | 6.90 U1 | | 5.80 K2 | 5.80 A5, R3, N4, W3, K2 | | | | |
| | Sterling, Ill. | | | | | | | | | 5.90 N4, K2 | | | | |
| | Cleveland, Ohio | 4.675 J3, R3 | 5.75 J3, R3 | | 6.325 R3 | | 6.90 R3 | 8.525 R3, J3 | | 5.80 A5 | | | | |
| | Detroit, Mich. | 4.775 G3, M2 | 5.85 G3, 5.75 M2 | | | | 7.00 G2 | 8.625 G3 | | | | | | |
| | Newport, Ky. | 4.675 N5 | 5.75 N5 | | | | | | | | | | | |
| | Gary, Ind. Harbor, Indiana | 4.675 U1, I3, Y1 | 5.75 U1, I3, Y1 | 6.30 U1, I3 | 6.325 U1, I3, Y1 | 6.70 U1 | 6.90 U1, Y1, I3 | 8.525 U1, Y1 | | 5.80 Y1 | \$9.60 U1, I3, Y1 | \$8.30 J3, U1, Y1 | 7.15 U1, Y1 | |
| | Granite City, Ill. | 4.875 G2 | 5.95 G2 | 6.50 G2 | 6.525 G2 | | | | | | | \$8.40 G2 | 7.25 G2 | |
| | Kokomo, Ind. | | | 6.40 C9 | | | | | | 5.90 C9 | | | | |
| | Manassas, Ohio | | 5.75 E2 | | | 6.70 E2 | | | | | | | | |
| | Middletown, Ohio | | 5.75 A7 | 6.30 A7 | 6.325 A7 | 6.70 A7 | | | | | | | | |
| | Niles, Warren, Ohio Sharon, Pa. | 4.675 S1, R3, N3 | 5.75 R3 | 6.30 R3 | 6.325 N3 | 6.70 N3 | 6.90 S1, R3 | 8.525 S1, R3 | | | | 8.30 R3 | | |
| | Pittsburgh, Pa. Midland, Pa. Butler, Pa. | 4.675 U1, J3, P6 | 5.75 U1, J3, P6 | 6.30 U1, J3 | 6.325 U1 | | 6.90 U1, J3, R3 | 8.525 U1, J3 | 9.275 U1 | 5.80 A5, P6, J3 | \$9.60 J3, U1 | \$8.30 U1 | 7.15 U1 | |
| | Portsmouth, Ohio | 4.675 P7 | 5.75 P7 | | | | | | | 5.80 P7 | | | | |
| | Weirton, Wheeling, Follinsbee, W. Va. | 4.675 W3, W5 | 5.75 W3, W5, F3 | 6.30 W3, W5 | | 6.70 W3, W5 | 6.90 W3 | 8.525 W3 | | | \$9.60 W5 | \$8.30 W5 | 7.15 W5, 7.40 W3 | |
| Youngstown, Ohio | 4.675 U1, Y1 | 5.75 Y1 | | 6.325 Y1 | | 6.90 Y1 | 8.525 Y1 | | 5.80 Y1 | | | 7.15 Y1 | | |
| WEST | Fontana, Cal. | 5.475 K1 | 6.95 K1 | | | | 7.70 K1 | 9.725 K1 | | | \$10.35 K1 | \$9.05 K1 | | |
| | Geneva, Utah | 4.775 C7 | | | | | | | | | | | | |
| | Kansas City, Mo. | | | | | | | | | 6.05 S2 | | | | |
| | Los Angeles, Torrance, Cal. | | | | | | | | | 6.60 B2 | | | | |
| | Minnequa, Colo. | | | | | | | | | 6.05 C6 | | | | |
| | San Francisco, Niles, Pittsburg, Cal. | 5.375 C7 | 6.70 C7 | 7.05 C7 | | | | | | 6.45 C7 | \$10.35 C7 | \$9.05 C7 | | |
| | Seattle, Wash. | | | | | | | | | | | | | |
| | SOUTH | Atlanta, Ga. | | | | | | | | | | | | |
| Fairfield, Ala. Alabama City, Ala. | | 4.675 T2, R3 | 5.75 T2 | 6.30 T2, R3 | | | | | | 5.80 T2, R3 | \$9.70 T2 | \$8.40 T2 | | |
| Houston, Tex. | | | | | | | | | | 6.05 S2 | | | | |

IRON AGE

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

STEEL PRICES

(Effective Sept. 18, 1956)

| | BARS | | | | | | PLATES | | | | WIRE |
|---|--------------------------------|-----------------------------|----------------------------------|------------------|----------------------------|------------------------|------------------|-------------|------------|-------------------|------------------------|
| | Carbon Steel | Reinforcing | Cold Finished | Alloy Hot-rolled | Alloy Cold Drawn | Hi Str. H.R. Low Alloy | Carbon Steel | Floor Plate | Alloy | Hi Str. Low Alloy | Mir's. Bright |
| EAST | | | | | | | | | | | |
| Bethlehem | | | | 6.125 B3 | 8.325 B3 | 7.40 B3 | | | | | |
| Buffalo, N. Y. | 5.075 B3,R3 | 5.075 B3,R3 | 6.90 B5 | 6.125 B3,R3 | 8.325 B5,B3 | 7.40 B3 | 4.85 B3 | | | | 7.20 W6 |
| Claymont, Del. | | | | | | | 5.35 C4 | | 6.85 C4 | 7.55 C4 | |
| Coatesville, Pa. | | | | | | | 5.25 L4 | | 6.85 L4 | 7.55 L4 | |
| Conschocken, Pa. | | | | | | | 4.90 A2 | 5.925 A2 | 6.25 A2 | 7.25 A2 | |
| Harrisburg, Pa. | | | | | | | 5.80 P2 | 6.275 C3 | | | |
| Hartford, Conn. | | | 7.35 R3 | | 8.625 R3 | 7.40 B3 | | | | | |
| Johnstown, Pa. | 5.075 B3 | 5.075 B3 | | 6.125 B3 | | | 4.85 B3 | | 6.85 B3 | 7.25 B3 | 7.20 B3 |
| Fairless, Pa. | 5.225 U1 | 5.225 U1 | | 6.275 U1 | | | | | | | |
| Newark, N. J. | | | 7.30 W10 | | 8.50 W10 | | | | | | |
| Camden, N. J. | | | 7.30 P10 | | 8.50 P10 | | | | | | |
| Bridgeport, Conn. | 5.30 N8 | 5.30 N8 | 7.20 N8 7.40 W10 | 6.20 N8 | 8.475 N8 | 7.50 N8 | | | | | |
| Sparrows Pt., Md. | | 5.075 B3 | | | | | 4.85 B3 | | 6.85 B3 | 6.85 B3 | 7.30 B3 |
| Palmer, Worcester, Readville, Mass. Milton, Pa. | 5.225 M7 | 5.225 M7 | 7.40 B5,C14 | | 8.325 A5 8.625 B5 | | | | | | 7.50 A5,W6 8.625 T8 |
| Spring City, Pa. | | | 7.30 K4 | | 8.50 K4 | | | | | | |
| MIDDLE WEST | | | | | | | | | | | |
| Alton, Ill. | 5.275 L1 | | | | | | | | | | 7.40 L1 |
| Ashland, Newport, Ky. | | | | | | | 4.85 A7,N5 | | 6.85 N5 | | |
| Canton-Massillon, Ohio | | | 6.85 R3,R2 | 6.125 R3,T5 | 8.325 R3,R2,T5 | | | | | | |
| Chicago, Joliet, Ill. | 5.075 U1,R3,W8,N4 5.575 P13 | 5.075 U1,R3,N4 5.575 P13 | 6.85 A5,B5,W10,L2,W8,L2,N9 | 6.125 U1,R3,W8 | 8.325 A5,B5,W8,L2,N9,W10 | 5.875 W8 | 4.85 U1,J3,W8,A1 | 5.925 U1 | 6.85 U1,W8 | 7.25 U1 | 7.20 A5,K2,R3,N4,W7 |
| Cleveland, Ohio | 5.075 R3 | 5.075 R3 | 6.85 A5,C13 | | 8.325 A5,C13 | 7.425 R3 | 4.95 J3,R3 | 5.925 J3 | | 7.25 J3,R3 | 7.20 A5,C13 |
| Detroit, Mich. | 5.175 G3 | 5.425 G3 | 7.05 B5,P8 7.10 P3 6.85 R5 | 8.325 G3 | 8.525 B5,P3,P8 8.325 R5 | 7.525 G3 | 4.95 G3 | | 6.90 G3 | | |
| Duluth, Minn. | | | | | | | | | | | 7.20 A5 |
| Gary, Ind. Harbor, Crawfordsville | 5.075 U1,J3,Y1 | 5.075 U1,J3,Y1 | 6.85 R3,M5 | 6.125 U1,J3,Y1 | 8.325 R3,M4 | 7.425 U1,J3,Y1 | 4.85 U1,J3,Y1 | 5.925 J3 | 6.85 U1,Y1 | 7.25 U1,Y1 | 7.30 M4 |
| Granite City, Ill. | | | | | | | 5.85 G2 | | | | |
| Kokomo, Ind. | | | | | | | | | | | 7.30 C9 |
| Sterling, Ill. | 5.525 N4 | 5.175 N4 | | | | | | | | | 7.30 K2 |
| Niles, Warren, Ohio Sharon, Pa. | | | 6.85 C10,C11 | 6.125 C10,S1 | 8.325 C10 | 7.425 S1 | 4.85 S1,R3 | | 6.85 S1 | 7.25 S1,R3 | |
| Pittsburgh, Pa. Midland, Pa. | 5.075 U1,C11,J3 | 5.075 U1,J3 | 6.85 A5,C8,C11,J3,R3,S9,B4,W10 | 6.125 U1,C11 | 8.325 A5,R3,S9,C8,W10 | 7.425 U1,J3 | 4.85 U1,J3 | 5.925 U1 | 6.85 U1,J3 | 7.25 U1,J3 | 7.20 A5,J3,P6 |
| Portsmouth, Ohio | | | | | | | | | | | 8.40 P7 |
| Weirton, Wheeling, Follansbee, W. Va. | | | | | | | 4.85 W5 | | | | |
| Youngstown, Ohio | 5.075 U1,Y1,R3 | 5.075 U1,Y1,R3 | 6.85 U1,Y1,F2 | 6.125 U1,Y1 | 8.325 Y1,F2 | 7.425 U1,Y1 | 4.85 U1,Y1,R3 | | 6.85 Y1 | 7.25 Y1 | 7.20 Y1 |
| WEST | | | | | | | | | | | |
| Emeryville, Cal. | 5.825 J5 | 5.825 J5 | | | | | | | | | |
| Fontana, Cal. | 5.775 K1 | 5.775 K1 | | 7.175 K1 | | 8.125 K1 | 5.55 K1 | | 7.55 K1 | 7.95 K1 | |
| Geneva, Utah | 5.175 C7 | | | | | | 4.85 C7 | | | 7.25 C7 | |
| Kansas City, Mo. | 5.325 S2 | 5.325 S2 | | 6.375 S2 | | 7.675 S2 | | | | | 7.45 S2 |
| Los Angeles, Torrance, Cal. | 5.775 C7,B2 | 5.775 C7,B2 | 8.30 R3 | 7.175 B2 | | 8.125 B2 | | | | | 8.15 B2 |
| Minneapolis, Colo. | 5.525 C6 | 5.525 C6 | | | | | 5.70 C6 | | | | 7.45 C6 |
| Portland, Ore. | 5.825 O2 | 5.825 O2 | | | | | | | | | |
| San Francisco, Niles, Pittsburg, Cal. | 5.775 C7,P9 5.825 B2 | 5.775 C7,P9 5.825 B2 | | | | 8.175 B2 | | | | | 8.15 C7,C6 |
| Seattle, Wash. | 5.825 B2 5.825 N6 | 5.825 B2 | | | | 8.175 B2 | 5.75 B2 | | 7.75 B2 | 8.15 B2 | |
| SOUTH | | | | | | | | | | | |
| Atlanta, Ga. | 5.575 A8 | | | | | | | | | | 7.40 A8 |
| Fairfield, Ala. City, Birmingham, Ala. | 5.075 T2,R3 5.375 C16 | 5.075 T2,R3 5.375 C16 | | | | 7.425 T2 | 4.85 T2,R3 | | | 7.25 T2 | 7.20 T2,R3 |
| Houston, Ft. Worth, Lone Star, Tex. | 5.325 S2 | 5.325 S2 | | 6.375 S2 | | 7.675 S2 | 4.95 S2 | | 6.95 S2 | 7.35 S2 | 7.45 S2 |

Steel Prices (Effective Sept. 18, 1956)

Key to Steel Producers

With Principal Offices

- A1 Acme Steel Co., Chicago
- A2 Alan Wood Steel Co., Conahohocken, Pa.
- A3 Allegheny Ludlum Steel Corp., Pittsburgh
- A4 American Cladmetals Co., Carnegie, Pa.
- A5 American Steel & Wire Div., Cleveland
- A6 Angell Nail & Chaplet Co., Cleveland
- A7 Armo Steel Corp., Middletown, Ohio
- A8 Atlantic Steel Co., Atlanta, Ga.

- B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
- B2 Bethlehem Pacific Coast Steel Corp., San Francisco
- B3 Bethlehem Steel Co., Bethlehem, Pa.
- B4 Blair Strip Steel Co., New Castle, Pa.
- B5 Bliss & Laughlin, Inc., Harvey, Ill.
- B6 Brock Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.

- C1 Calstrip Steel Corp., Los Angeles
- C2 Carpenter Steel Co., Reading, Pa.
- C3 Central Iron & Steel Co., Harrisburg, Pa.
- C4 Claymont Products Dept., Claymont, Del.
- C5 Cold Metals Products Co., Youngstown, O.
- C6 Colorado Fuel & Iron Corp., Denver
- C7 Columbia Geneva Steel Div., San Francisco
- C8 Columbia Steel & Shifting Co., Pittsburgh
- C9 Continental Steel Corp., Kokomo, Ind.
- C10 Copperweld Steel Co., Pittsburgh, Pa.
- C11 Crucible Steel Co. of America, Pittsburgh
- C12 Cumberland Steel Co., Cumberland, Md.
- C13 Cuyahoga Steel & Wire Co., Cleveland
- C14 Compressed Steel Shifting Co., Readville, Mass.
- C15 G. O. Carlson, Inc., Thorndale, Pa.
- C16 Connors Steel Div., Birmingham
- C17 Chester Blast Furnace, Inc., Chester, Pa.

- D1 Detroit Steel Corp., Detroit
- D2 Detroit Tube & Steel Div., Detroit
- D3 Driver Harris Co., Harrison, N. J.
- D4 Dickson Weatherproof Nail Co., Evanston, Ill.
- D5 Henry Dison Div., Philadelphia

- E1 Eastern Stainless Steel Corp., Baltimore
- E2 Empire Steel Co., Mansfield, O.
- F1 Firth Sterling, Inc., McKeesport, Pa.
- F2 Fitzsimons Steel Corp., Youngstown
- F3 Follanbee Steel Corp., Follanbee, W. Va.

- G2 Granite City Steel Co., Granite City, Ill.
- G3 Great Lakes Steel Corp., Detroit
- G4 Greer Steel Co., Dover, O.
- H1 Hanna Furnace Corp., Detroit
- I2 Ingersoll Steel Div., Chicago
- I3 Inland Steel Co., Chicago
- I4 Interlake Iron Corp., Cleveland
- J1 Jackson Iron & Steel Co., Jackson, O.
- J2 Jessop Steel Corp., Washington, Pa.
- J3 Jones & Laughlin Steel Corp., Pittsburgh
- J4 Joslyn Mfg. & Supply Co., Chicago
- J5 Judson Steel Corp., Emeryville, Calif.

- K1 Kaiser Steel Corp., Fontana, Cal.
- K2 Keystone Steel & Wire Co., Pottsville
- K3 Koppers Co., Granite City, Ill.
- K4 Keystone Drawn Steel Co., Spring City, Pa.

- L1 Laclede Steel Co., St. Louis
- L2 La Salle Steel Co., Chicago
- L3 Lone Star Steel Co., Dallas
- L4 Lukens Steel Co., Coatesville, Pa.

- M1 Mahoning Valley Steel Co., Niles, O.
- M2 McLouth Steel Corp., Detroit
- M3 Mercer Tube & Mfg. Co., Sharon, Pa.
- M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
- M5 Monarch Steel Div., Hammond, Ind.
- M6 Mystic Iron Works, Everett, Mass.
- M7 Milton Steel Products Div., Milton, Pa.

- N1 National Supply Co., Pittsburgh
- N2 National Tube Div., Pittsburgh
- N3 Niles Rolling Mill Div., Niles, O.
- N4 Northwestern Steel & Wire Co., Sterling, Ill.
- N5 Newport Steel Corp., Newport, Ky.
- N6 Northwest Steel Rolling Mills, Seattle
- N7 Newman Crosby Steel Co., Pawtucket, R. I.
- N8 Northeastern Steel Corp., Bridgeport, Conn.
- N9 Nelson Steel & Wire Co.

- O1 Oliver Iron & Steel Co., Pittsburgh
- O2 Oregon Steel Mills, Portland
- P1 Page Steel & Wire Div., Monessen, Pa.
- P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
- P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
- P4 Pittsburgh Coke & Chemical Co., Pittsburgh
- P5 Pittsburgh Screw & Bolt Co., Pittsburgh
- P6 Pittsburgh Steel Co., Pittsburgh
- P7 Portsmouth Div., Detroit Steel Corp., Detroit
- P8 Plymouth Steel Co., Detroit

- P9 Pacific States Steel Co., Niles, Cal.
- P10 Precision Drawn Steel Co., Camden, N.
- P11 Production Steel Strip Co., Detroit
- P13 Phoenix Mfg. Co., Joliet, Ill.
- R1 Reeves Steel & Mfg. Co., Dover, O.
- R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
- R3 Republic Steel Corp., Cleveland
- R4 Roebbing Sons Co., John A., Trenton, N. J.
- R5 Rotary Electric Steel Co., Detroit
- R6 Rodney Metals, Inc., New Bedford, Mass.
- R7 Rome Strip Steel Co., Rome, N. Y.

- S1 Sharon Steel Corp., Sharon, Pa.
- S2 Sheffield Steel Div., Kansas City
- S3 Shenango Furnace Co., Pittsburgh
- S4 Simonds Saw and Steel Co., Fitchburg, Mass.
- S5 Sweet's Steel Co., Williamsport, Pa.
- S6 Standard Forging Corp., Chicago
- S7 Stanley Works, New Britain, Conn.
- S8 Superior Drawn Steel Co., Monaca, Pa.
- S9 Superior Steel Corp., Carnegie, Pa.
- S10 Seneca Steel Service, Buffalo

- T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
- T2 Tennessee Coal & Iron Div., Fairfield
- T3 Tennessee Products & Chem. Corp., Nashville
- T4 Thomas Strip Div., Warren, O.
- T5 Timken Steel & Tube Div., Canton, O.
- T7 Texas Steel Co., Fort Worth
- T8 Thompson Wire Co., Boston

- U1 United States Steel Corp., Pittsburgh
- U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
- U3 Ulbrich Stainless Steels, Wallingford, Conn.
- U4 U. S. Pipe & Foundry Co., Birmingham

- W1 Wallingford Steel Co., Wallingford, Conn.
- W2 Washington Steel Corp., Washington, Pa.
- W3 Weirton Steel Co., Weirton, W. Va.
- W4 Wheatland Tube Co., Wheatland, Pa.
- W5 Wheeling Steel Corp., Wheeling, W. Va.
- W6 Wickwire Spencer Steel Div., Buffalo
- W7 Wilson Steel & Wire Co., Chicago
- W8 Wisconsin Steel Div., S. Chicago, Ill.
- W9 Woodward Iron Co., Woodward, Ala.
- W10 Wyckoff Steel Co., Pittsburgh
- W12 Wallace Barnes Steel Div., Bristol, Conn.

- Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (per cent) f.o.b. mills. Base price about \$200 per net ton.

| | BUTTWELD | | | | | | | | | | | | | | SEAMLESS | | | | | | | | | |
|-------------------|----------|--------|---------|--------|-------|-------|-----------|-------|-----------|-------|-------|-------|-------------|-------|----------|--------|-----------|--------|-------|-------|-------------|-------|--|--|
| | 1/2 In. | | 3/4 In. | | 1 In. | | 1 1/4 In. | | 1 1/2 In. | | 2 In. | | 2 1/2-3 In. | | 2 In. | | 2 1/2 In. | | 3 In. | | 3 1/2-4 In. | | | |
| | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | | |
| STANDARD T. & C. | | | | | | | | | | | | | | | | | | | | | | | | |
| Sparrows Pt. B3 | 10.50 | +4.75 | 13.50 | +0.75 | 16.00 | 2.75 | 18.50 | 3.50 | 19.00 | 4.50 | 19.50 | 5.00 | 21.00 | 4.75 | | | | | | | | | | |
| Youngstown R3 | 12.50 | +2.75 | 15.50 | 1.25 | 18.00 | 4.75 | 20.50 | 5.50 | 21.00 | 6.50 | 21.50 | 7.00 | 23.00 | 6.75 | | | | | | | | | | |
| Fontana K1 | 0.00 | +15.25 | 3.00 | +11.25 | 5.50 | +7.75 | 8.00 | +7.00 | 8.50 | +6.00 | 9.00 | +5.50 | 10.50 | +5.75 | | | | | | | | | | |
| Pittsburgh J3 | 12.50 | +2.75 | 15.50 | 1.25 | 18.00 | 4.75 | 20.50 | 5.50 | 21.00 | 6.50 | 21.50 | 7.00 | 23.00 | 6.75 | +2.00 | +17 | 4.50 | +12.25 | 7.00 | +9.75 | 8.50 | +8.25 | | |
| Alton, Ill. L1 | 10.50 | +4.75 | 13.50 | +0.75 | 16.00 | 2.75 | 18.50 | 3.50 | 19.00 | 4.50 | 19.50 | 5.00 | 21.00 | 4.75 | | | | | | | | | | |
| Sharon M3 | 12.50 | +2.75 | 15.50 | 1.25 | 18.00 | 4.75 | 20.50 | 5.50 | 21.00 | 6.50 | 21.50 | 7.00 | 23.00 | 6.75 | | | | | | | | | | |
| Fairless N2 | 10.50 | +4.75 | 13.50 | +0.75 | 16.00 | 2.75 | 18.50 | 3.50 | 19.00 | 4.50 | 19.50 | 5.00 | 21.00 | 4.75 | | | | | | | | | | |
| Pittsburgh N1 | 12.50 | +2.75 | 15.50 | 1.25 | 18.00 | 4.75 | 20.50 | 5.50 | 21.00 | 6.50 | 21.50 | 7.00 | 23.00 | 6.75 | +2.00 | +17 | 4.50 | +12.25 | 7.00 | +9.75 | 8.50 | +8.25 | | |
| Wheeling W5 | 12.50 | +2.75 | 15.50 | 1.25 | 18.00 | 4.75 | 20.50 | 5.50 | 21.00 | 6.50 | 21.50 | 7.00 | 23.00 | 6.75 | | | | | | | | | | |
| Wheatland W4 | 12.50 | +2.75 | 15.50 | 1.25 | 18.00 | 4.75 | 20.50 | 5.50 | 21.00 | 6.50 | 21.50 | 7.00 | 23.00 | 6.75 | +2.00 | +17 | 4.50 | +12.25 | 7.00 | +9.75 | 8.50 | +8.25 | | |
| Youngstown Y1 | 12.50 | +2.75 | 15.50 | 1.25 | 18.00 | 4.75 | 20.50 | 5.50 | 21.00 | 6.50 | 21.50 | 7.00 | 23.00 | 6.75 | | | | | | | | | | |
| Indiana Harbor Y1 | 11.50 | +5.75 | 14.50 | 1.25 | 17.00 | 3.75 | 19.50 | 4.50 | 20.00 | 5.50 | 20.50 | 6.00 | 22.00 | 5.75 | | | | | | | | | | |
| Lorain N2 | 12.50 | +2.75 | 15.50 | 1.25 | 18.00 | 4.75 | 20.50 | 5.50 | 21.00 | 6.50 | 21.50 | 7.00 | 23.00 | 6.75 | +2.00 | +17 | 4.50 | +12.25 | 7.00 | +9.75 | 8.50 | +8.25 | | |
| EXTRA STRONG | | | | | | | | | | | | | | | | | | | | | | | | |
| PLAIN ENDS | | | | | | | | | | | | | | | | | | | | | | | | |
| Sparrows Pt. B3 | 15.00 | 1.25 | 19.00 | 5.25 | 21.00 | 8.75 | 21.50 | 7.50 | 22.00 | 8.50 | 22.50 | 9.00 | 23.00 | 7.75 | | | | | | | | | | |
| Youngstown R3 | 17.00 | 3.25 | 21.00 | 7.25 | 23.00 | 10.75 | 23.50 | 9.75 | 24.00 | 10.50 | 24.50 | 11.00 | 25.00 | 9.75 | | | | | | | | | | |
| Fairless N2 | 15.00 | 1.25 | 19.00 | 5.25 | 21.00 | 8.75 | 21.50 | 7.50 | 22.00 | 8.50 | 22.50 | 9.00 | 23.00 | 7.75 | | | | | | | | | | |
| Fontana K1 | 4.50 | | 8.50 | | 10.50 | | 11.00 | | 11.50 | | 12.00 | | 12.50 | | | | | | | | | | | |
| Pittsburgh J3 | 17.00 | 3.25 | 21.00 | 7.25 | 23.00 | 10.75 | 23.50 | 9.75 | 24.00 | 10.50 | 24.50 | 11.00 | 25.00 | 9.75 | +8.50 | +14.50 | 7.00 | +8.75 | 9.50 | +6.25 | 14.50 | +1.25 | | |
| Alton, Ill. L1 | 15.00 | 1.25 | 19.00 | 5.25 | 21.00 | 8.75 | 21.50 | 7.50 | 22.00 | 8.50 | 22.50 | 9.00 | 23.00 | 7.75 | | | | | | | | | | |
| Sharon M3 | 17.00 | 3.25 | 21.00 | 7.25 | 23.00 | 10.75 | 23.50 | 9.75 | 24.00 | 10.50 | 24.50 | 11.00 | 25.00 | 9.75 | | | | | | | | | | |
| Pittsburgh N1 | 17.00 | 3.25 | 21.00 | 7.25 | 23.00 | 10.75 | 23.50 | 9.75 | 24.00 | 10.50 | 24.50 | 11.00 | 25.00 | 9.75 | +8.50 | +14.50 | 7.00 | +8.75 | 9.50 | +6.25 | 14.50 | +1.25 | | |
| Wheeling W5 | 17.00 | 3.25 | 21.00 | 7.25 | 23.00 | 10.75 | 23.50 | 9.75 | 24.00 | 10.50 | 24.50 | 11.00 | 25.00 | 9.75 | | | | | | | | | | |
| Wheatland W4 | 17.00 | 3.25 | 21.00 | 7.25 | 23.00 | 10.75 | 23.50 | 9.75 | 24.00 | 10.50 | 24.50 | 11.00 | 25.00 | 9.75 | | | | | | | | | | |
| Youngstown Y1 | 17.00 | 3.25 | 21.00 | 7.25 | 23.00 | 10.75 | 23.50 | 9.75 | 24.00 | 10.50 | 24.50 | 11.00 | 25.00 | 9.75 | +8.50 | +14.50 | 7.00 | +8.75 | 9.50 | +6.25 | 14.50 | +1.25 | | |
| Indiana Harbor Y1 | 16.00 | 2.25 | 20.00 | 6.25 | 22.00 | 9.75 | 22.50 | 8.50 | 23.00 | 9.50 | 23.50 | 10.00 | 22.00 | 8.75 | | | | | | | | | | |
| Lorain N2 | 17.00 | 3.25 | 21.00 | 7.25 | 23.00 | 10.75 | 23.50 | 9.75 | 24.00 | 10.50 | 24.50 | 11.00 | 25.00 | 9.75 | +8.50 | +14.50 | 7.00 | +8.75 | 9.50 | +6.25 | 14.50 | +1.25 | | |

Threads only, butt weld and seamless 2 1/4 pt. higher discount. Plain ends, butt weld and seamless, 3-in. and under, 5 1/2 pt. higher discount. Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: 1/2, 3/4 and 1-in., 2 pt.; 1 1/4, 1 1/2 and 2-in., 1 1/2 pt.; 2 1/2 and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2 1/2" and 3" pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 13.50¢ per lb.

TOOL STEEL

| F.o.b. mill | | | | | | |
|---|----|-----|----|----|--------|-----|
| W | Cr | V | Mo | Co | per lb | SAE |
| 18 | 4 | 1 | — | — | \$1.65 | T-1 |
| 18 | 4 | 1 | — | 5 | 2.385 | T-4 |
| 18 | 4 | 2 | — | — | 1.845 | T-2 |
| 1.5 | 4 | 1.5 | 8 | — | 1.04 | M-1 |
| 6 | 4 | 3 | 6 | — | 1.43 | M-3 |
| 6 | 4 | 2 | 6 | — | 1.185 | M-2 |
| High-carbon chromium .83 D-3, D-5 | | | | | | |
| Oil hardened manganese .45 O-2 | | | | | | |
| Special carbon .41 W-1 | | | | | | |
| Extra carbon .345 W-1 | | | | | | |
| Regular carbon .29 W-1 | | | | | | |
| Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher. | | | | | | |

CLAD STEEL

Base prices, cents per lb f.o.b.

| Cladding | Plate (A3, J2, L4) | | Sheet (12) | |
|----------|--------------------|--------|------------|--------|
| | 10 pct | 15 pct | 20 pct | 20 pct |
| 304 | 34.60 | 38.00 | 41.50 | |
| 316 | 39.70 | 43.20 | 46.45 | |
| 321 | 36.35 | 39.80 | 43.50 | |
| 347 | 39.50 | 43.95 | 48.45 | |
| 405 | 29.20 | 33.15 | 37.05 | |
| 410, 430 | 28.70 | 32.65 | 36.55 | |

CR Strip (89) Copper, 10 pct, 2 sides, 41.40; 1 side, 33.60.

WAREHOUSES

| Cities | City Delivery + Charge | Sheets | | Strip | | Plates | | Shapes | | Bars | | Alloy Bars | | | |
|----------------|------------------------|------------|-----------------------|------------|-----------------------|------------|-------------|---------------------|------------|---------------|------------|---------------------------|---------------------------|---------------------------|---------------------------|
| | | Hot-Rolled | Cold-Rolled (15 gage) | Hot-Rolled | Cold-Rolled (10 gage) | Hot-Rolled | Cold-Rolled | Standard Structural | Hot-Rolled | Cold-Finished | Hot-Rolled | Hot-Rolled 4015 As Rolled | Hot-Rolled 4140 As Rolled | Cold-Drawn 4015 As Rolled | Cold-Drawn 4140 As Rolled |
| | | Hot-Rolled | Cold-Rolled (15 gage) | Hot-Rolled | Cold-Rolled (10 gage) | Hot-Rolled | Cold-Rolled | Standard Structural | Hot-Rolled | Cold-Finished | Hot-Rolled | Hot-Rolled 4015 As Rolled | Hot-Rolled 4140 As Rolled | Cold-Drawn 4015 As Rolled | Cold-Drawn 4140 As Rolled |
| Atlanta | | 8.07 | 9.27 | 9.83 | 8.16 | 8.40 | 8.44 | 8.30 | 10.14 | | | | | | |
| Baltimore | \$.10 | 7.79 | 9.54 | 9.12 | 8.27 | 8.12 | 8.57 | 8.34 | 9.09 | 14.99 | 14.44 | 18.39 | 18.09 | | |
| Birmingham | .15 | 7.68 | 8.88 | 8.85 | 7.78 | 8.01 | 8.05 | 7.91 | 10.04 | | | | | | |
| Beaton | .10 | 8.79 | 9.73 | 10.82 | 8.79 | 8.98 | 8.90 | 8.88 | 10.71 | 15.05 | 14.45 | 18.51 | 18.10 | | |
| Buffalo | .15 | 8.80 | 9.83 | 11.02 | 8.89 | 9.08 | 9.00 | 8.98 | 10.81 | 15.00 | 14.45 | 18.40 | | | |
| Chicago | .15 | 7.70 | 8.88 | 9.85 | 7.78 | 8.01 | 8.05 | 7.91 | 8.35 | 14.65 | 14.10 | 18.05 | 17.75 | | |
| Cincinnati | .15 | 7.45 | 8.65 | 9.62 | 7.93 | 8.16 | 8.20 | 8.06 | 8.50 | 14.93 | 14.38 | 18.33 | 18.03 | | |
| Cleveland | .15 | 7.97 | 9.04 | 9.85 | 8.21 | 8.40 | 8.40 | 8.15 | 8.85 | 14.73 | 14.18 | 18.13 | 17.83 | | |
| Denver | | 7.83 | 9.03 | 9.75 | 8.03 | 8.36 | 8.53 | 8.14 | 8.75 | 14.73 | 14.18 | 18.13 | 17.83 | | |
| Detroit | .15 | 9.55 | 11.09 | 12.41 | 9.70 | 9.80 | 9.60 | 9.75 | 10.54 | | | | 19.79 | | |
| Houston | | 8.06 | 9.28 | 10.17 | 8.25 | 8.48 | 8.70 | 8.33 | 8.83 | 14.04 | | | 17.09 | | |
| Kansas City | .20 | 8.52 | 9.72 | 10.07 | 8.60 | 8.83 | 8.87 | 8.73 | 9.42 | 15.32 | 14.77 | 18.72 | 18.42 | | |
| Los Angeles | .10 | 9.00 | 10.75 | 11.75 | 9.20 | 9.45 | 9.05 | 8.90 | 11.80 | 15.85 | 15.35 | 19.70 | 19.45 | | |
| Memphis | .15 | 8.02 | 9.22 | | 8.12 | 8.35 | 8.39 | 8.25 | 9.85 | | | | | | |
| Milwaukee | .15 | 7.97 | 9.17 | 9.97 | 8.05 | 8.28 | 8.39 | 8.18 | 8.72 | 14.77 | | | 18.17 | 17.07 | |
| New Orleans | .15 | | | | | | | | | | | | | | |
| New York | | 8.45 | 9.63 | 10.33 | 8.91 | 8.88 | 8.84 | 8.93 | 10.71 | 15.02 | 14.47 | 18.42 | 18.12 | | |
| Norfolk | .20 | 8.00 | | | 8.40 | 8.35 | 8.70 | 8.45 | 10.70 | | | | | | |
| Philadelphia | .10 | 7.89 | 9.08 | 9.66 | 8.58 | 8.28 | 8.38 | 8.37 | 9.12 | 14.80 | 14.15 | 18.20 | 17.90 | | |
| Pittsburgh | .15 | 7.99 | 9.18 | 10.22 | 8.68 | 8.38 | 8.48 | 8.47 | 9.22 | 14.25 | 13.25 | 18.05 | 16.85 | | |
| Portland | | 7.63 | 9.03 | 10.20 | 8.03 | 8.16 | 8.20 | 8.06 | 8.75 | 14.65 | 13.85 | 18.05 | 16.85 | | |
| Salt Lake City | .20 | 8.90 | 9.65 | 11.40 | 9.05 | 8.70 | 8.90 | 8.95 | 13.55 | 16.70 | 16.10 | 20.40 | 20.25 | | |
| San Francisco | .10 | 8.85 | 10.40 | 10.90 | 9.05 | 8.95 | 8.95 | 8.90 | 12.40 | 15.85 | 15.35 | 19.70 | 19.45 | | |
| Seattle | .00 | 9.35 | 11.20 | 11.55 | 9.50 | 9.05 | 9.15 | 9.30 | 13.15 | 16.10 | 15.55 | 19.50 | 19.20 | | |
| St. Louis | .15 | 8.02 | 9.16 | 10.03 | 8.11 | 8.34 | 8.48 | 8.25 | 8.93 | 14.83 | 14.28 | 18.23 | 17.93 | | |
| St. Paul | .25 | 8.17 | 9.36 | 10.18 | 8.26 | 8.49 | 8.63 | 8.40 | 9.08 | 14.98 | | | | | |

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity.

** F.O.B. Plant, warehouse price.

† 16 gage.

‡ Deduct for country delivery.

ELECTRICAL SHEETS

| 22-Gage | Hot-Rolled (Cut Lengths)* | Cold-Reduced (Coiled or Cut Length) | |
|----------------|------------------------------|--|-----------------|
| | | Semi-Processed | Fully Processed |
| Field | 9.00 | 9.20 | 10.00 |
| Armature | 10.35 | 10.35 | 10.85 |
| Elect. | 11.00 | 11.025 | 11.525 |
| Motor | 12.05 | 12.075 | 12.575 |
| Dynamo | 13.05 | 13.05 | 13.55 |
| Trans. 72 | 14.05 | 14.05 | 14.55 |
| Trans. 65 | 14.60 | | |
| Grain Oriented | | | |
| Trans. 58 | 15.10 | Trans. 80 | 18.50 |
| Trans. 52 | 16.15 | Trans. 73 | 19.00 |

Producing plants: Beech Bottom (W5); Brackenridge (A5); Granite City (G2); Indiana Harbor (I3); Mansfield (E7); Newport, Ky. (N5); Niles, O. (N3); Vandergrift (U1); Warren, O. (R3) (20¢ higher, HR); Zanesville, Butler (A7).

LAKE SUPERIOR ORES

\$1.50¢ Fe natural content, delivered lower Lake ports. Prices for 1956 season. Freight changes for seller's account.

| | |
|------------------------|---------|
| Openhearth lump | \$11.10 |
| Old range, bessemer | 11.86 |
| Old range, nonbessemer | 11.16 |
| Measbl, bessemer | 11.00 |
| Measbl, nonbessemer | 10.88 |
| High phosphorus | 10.88 |

MERCHANT WIRE PRODUCTS

| F.o.b. Mill | Standard & Coated Nails | | Woven Wire Fence 9-15½ ga. | | Single Loop Bala Ties | | Galv. Barbed and Twisted Barbed Wire | | March Wire Ann'd | | March Wire Galv. | |
|----------------------|-------------------------|-----|----------------------------|-----|-----------------------|------|--------------------------------------|------|------------------|-----|------------------|-----|
| | Cal | Cal | Cal | Cal | Cal | Cal | Cal | Cal | Cal | Cal | Cal | Cal |
| Alabama City R3 | 167 | 181 | | | 195 | 187 | 8.10 | 8.50 | | | | |
| Altoona, Pa. J3 | 167 | 184 | | | 191 | 184 | 8.10 | 8.45 | | | | |
| Atlanta A8 | 169 | 187 | | | 197 | 193 | 8.20 | 8.80 | | | | |
| Bartonsville K2 | 169 | 187 | | | 197 | 193 | 8.20 | 8.80 | | | | |
| Buffalo W5 | | | | | | | 8.10 | 8.50 | | | | |
| Chicago, Ill. N4 | 167 | 185 | 167 | 195 | 191 | 8.10 | 8.70 | | | | | |
| Cleveland A6 | 173 | | | | | | 8.10 | | | | | |
| Cleveland A5 | | | | | | | 8.10 | | | | | |
| Crawfordsville M4 | 169 | 187 | | | 197 | 193 | 8.20 | 8.80 | | | | |
| Dunora, Pa. A5 | 167 | 181 | | | 195 | 187 | 8.10 | 8.50 | | | | |
| Duluth A5 | 167 | 181 | | | 195 | 187 | 8.10 | 8.50 | | | | |
| Fairfield, Ala. T2 | 167 | 181 | | | 195 | 187 | 8.10 | | | | | |
| Galveston D4 | 169 | | | | | | 8.10 | | | | | |
| Houston S2 | 172 | 186 | | | 200 | 192 | 8.35 | 8.75 | | | | |
| Johnstown, Pa. B3 | 167 | 185 | 167 | | 191 | 8.10 | 8.70 | | | | | |
| Johnst. Ill. A5 | 167 | 181 | | | 195 | 189 | 8.10 | | | | | |
| Kokomo, Ind. C9 | 169 | 183 | | | 197 | 189 | 8.20 | 8.60 | | | | |
| Los Angeles B3 | | | | | | | 9.05 | 9.65 | | | | |
| Kansas City S2 | 172 | 186 | | | 200 | 192 | 8.35 | 8.75 | | | | |
| Minneapolis C6 | 172 | 186 | 172 | 200 | 192 | 8.35 | 8.75 | | | | | |
| Monessen P6 | 167 | 185 | | | 191 | 8.10 | 8.10 | | | | | |
| Pittsburg, Cal. C7 | 186 | 204 | | | 207 | 9.05 | 9.45 | | | | | |
| Portsmouth P7 | | | | | | | 8.10 | | | | | |
| Rankin, Pa. A5 | 167 | 181 | | | 195 | 187 | 8.10 | 8.50 | | | | |
| St. Chicago R3 | 167 | 181 | | | 195 | 187 | 8.10 | 8.50 | | | | |
| S. San Francisco C6 | | | | | 219 | 9.05 | 9.45 | | | | | |
| Sparrows Pt. B3 | | | | | 197 | 193 | 8.20 | 8.80 | | | | |
| Struthers, O. Y1 | | | | | | | 8.10 | 8.60 | | | | |
| Worcester A5 | 173 | | | | | | 8.10 | 8.60 | | | | |
| Williamsport, Pa. S5 | | | 175 | | | | 8.10 | 8.60 | | | | |

Galvanized products compared with zinc at 5¢ per lb. Exceptions: * zinc at 12.5¢ per lb. ** 13½¢ zinc.

† —Wholesalers only.

C-R SPRING STEEL

| Cents Per Lb F.o.b. Mill | CARBON CONTENT | | | | |
|-----------------------------|----------------|-------|-------|-------|-------|
| | 0.26 | 0.41 | 0.61 | 0.81 | 1.00 |
| | 0.40 | 0.60 | 0.80 | 1.05 | 1.35 |
| Baltimore, Md. T8 | 8.25 | 10.10 | 12.90 | 15.30 | 18.25 |
| Bristol, Conn. W12 | | | 12.90 | 15.30 | 18.25 |
| Boston T8 | 8.50 | 10.10 | 12.90 | 15.30 | 18.25 |
| Buffalo, N. Y. R7 | 7.95 | 9.80 | 12.60 | 15.00 | 17.95 |
| Carnegie, Pa. S9 | | 9.80 | 12.60 | 15.00 | |
| Cleveland A5 | 7.95 | 9.80 | 12.60 | 15.00 | 17.95 |
| Detroit D1 | 8.05 | 9.90 | 12.70 | 15.10 | |
| Detroit D2 | | | | | |
| Dover, O. G7 | 7.95 | 9.80 | 12.60 | 15.00 | 17.95 |
| Franklin Park, Ill. T8 | 8.05 | 9.80 | 12.60 | 15.00 | 17.95 |
| Harrison, N. J. C11 | | | 12.90 | 15.30 | 18.25 |
| Indianapolis C5 | 8.10 | 9.95 | 12.60 | 15.00 | 17.95 |
| New Castle, Pa. B4 | 7.95 | 9.80 | 12.60 | 15.00 | |
| New Haven, Conn. D1 | 8.40 | 10.10 | 12.90 | 15.30 | |
| Pawtucket, R. I. N7 | 8.50 | 10.10 | 12.90 | 15.30 | 18.25 |
| Pittsburgh S7 | 7.95 | 9.80 | 12.60 | 15.00 | 17.95 |
| Riverside, Ill. A1 | 8.05 | 9.80 | 12.60 | 15.00 | 17.95 |
| Sharon, Pa. S7 | 8.05 | 9.90 | 12.70 | | |
| Trenton R4 | | 10.10 | 12.90 | 15.30 | 18.25 |
| Wallingford W1 | 8.40 | 10.10 | 12.90 | 15.30 | 18.15 |
| Warren, Ohio T4 | 7.95 | 9.80 | 12.60 | 15.00 | 17.95 |
| Weirton, W. Va. W3 | 7.95 | 9.80 | 12.60 | 15.00 | 17.95 |
| Worcester, Mass. A5 | 8.50 | 10.10 | 12.90 | 15.30 | 18.25 |
| Youngstown C5 | 7.95 | 9.80 | 12.60 | 15.00 | 17.95 |

† On Application.

BOILER TUBES

| \$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill | Size | | Seamless | | Elec. Weld | |
|---|--------|----------|----------|-------|------------|------|
| | OD-In. | B.W. Ga. | H.R. | C.D. | H.R. | C.D. |
| | OD-In. | B.W. Ga. | H.R. | C.D. | H.R. | C.D. |
| Babcock & Wilcox.... | 2 | 13 | 34.88 | 40.85 | 33.21 | .... |
| | 2½ | 12 | 46.98 | 55.01 | 44.73 | .... |
| | 3 | 12 | 54.24 | 63.53 | 51.66 | .... |
| | 3½ | 11 | 63.32 | 74.16 | 60.30 | .... |
| | 4 | 10 | 84.09 | 98.47 | 80.07 | .... |
| National Tube..... | 2 | 13 | 34.88 | 40.85 | 33.21 | .... |
| | 2½ | 12 | 46.98 | 55.01 | 44.73 | .... |
| | 3 | 12 | 54.24 | 63.53 | 51.66 | .... |
| | 3½ | 11 | 63.32 | 74.16 | 60.30 | .... |
| | 4 | 10 | 84.09 | 98.47 | 80.07 | .... |
| Pittsburgh Steel.... | 2 | 13 | 34.88 | 40.85 | .... | .... |
| | 2½ | 12 | 46.98 | 55.01 | .... | .... |
| | 3 | 12 | 54.24 | 63.53 | .... | .... |
| | 3½ | 11 | 63.32 | 74.16 | .... | .... |
| | 4 | 10 | 84.09 | 98.47 | .... | .... |

(Effective Sept. 18, 1956)

RAILS, TRACK SUPPLIES

| F.o.b. Mill Cents Per Lb. | No. 1 Std. Rail | Light Rail | Joint Bars | Track Spikes | Screw Spikes | Tie Plates | Track Bolts Illustrated |
|------------------------------|-----------------------|---------------|---------------|-----------------|-----------------|---------------|-------------------------------|
| Bessemer U.I. | 5.075 | 6.00 | 6.35 | | | | |
| So. Chicago R3 | | | | 8.775 | | | |
| Eastley T2 | 5.075 | 6.00 | | | | | |
| Fairfield T2 | | 6.00 | | 8.775 | 6.025 | | |
| Gary U.I. | 5.075 | 6.00 | | | 6.025 | | |
| Ind. Harbor J3 | 5.075 | | 6.35 | 8.775 | 6.025 | | |
| Ind. Harbor V1 | | | | | | | |
| Johnstown B3 | | 6.00 | | | | | |
| Joliet U.I. | 5.075 | | 6.35 | | | | |
| Kansas City S2 | | | | 8.775 | | | |
| Lackawanna B3 | 5.075 | 6.00 | 6.35 | | 6.025 | | |
| Lebanon B3 | | | | | | | |
| Minneapolis C6 | 5.075 | 6.50 | 6.35 | 8.775 | 6.025 | 13.10 | |
| Pittsburgh P5 | | | | 8.775 | 12.85 | | |
| Pittsburgh J3 | | | | 8.775 | | 13.10 | |
| Seattle B2 | | | | 9.275 | 6.35 | 16.60 | |
| Steelton B3 | 5.075 | | 6.35 | | 6.175 | 13.60 | |
| Struthers V1 | | | | 8.775 | | | |
| Torrance C7 | | | | | | | |
| Williamsport S5 | | 6.15 | | | | | |
| Youngstown R3 | | | | 8.775 | | | |

COKE

Furnace, beehive (f.o.b. oven) Net-Ton
Connellsville, Pa. \$14.50 to \$14.75
Foundry, beehive (f.o.b. oven)

\$17.00 to \$18.00

Foundry, oven coke

| | |
|---------------------------|---------|
| Buffalo, del'd | \$30.75 |
| Detroit, f.o.b. | 29.50 |
| New England, del'd | 30.55 |
| Seaboard, N. J., f.o.b. | 28.75 |
| Philadelphia, f.o.b. | 28.50 |
| Swedenland, Pa., f.o.b. | 28.50 |
| Painesville, Ohio, f.o.b. | 29.50 |
| Erie, Pa., f.o.b. | 29.50 |
| Cleveland, del'd | 31.55 |
| Cincinnati, del'd | 28.59 |
| St. Paul, f.o.b. | 28.50 |
| St. Louis, f.o.b. | 30.50 |
| Birmingham, f.o.b. | 27.60 |
| Milwaukee, f.o.b. | 29.59 |

ELECTRODES

Cents per lb f.o.b. plant, threaded, with
nipples, unboxed.

| GRAPHITE | | | CARBON* | | |
|----------------|-----------------|-------|----------------|-----------------|-------|
| Diam. (in.) | Length (in.) | Price | Diam. (in.) | Length (in.) | Price |
| 24 | 84 | 23.00 | 40 | 100, 110 | 9.90 |
| 20 | 72 | 22.25 | 35 | 110 | 9.90 |
| 16 to 18 | 72 | 22.50 | 30 | 110 | 10.05 |
| 14 | 72 | 23.00 | 24 | 72 to 84 | 10.30 |
| 12 | 72 | 23.50 | 20 | 90 | 10.10 |
| 10 | 60 | 24.75 | 17 | 72 | 10.35 |
| 7 | 60 | 24.50 | 14 | 72 | 10.85 |
| 5 | 60 | 27.25 | 12 | 60 | 11.75 |
| 4 | 40 | 30.25 | 10 | 60 | 11.80 |
| 3 | 40 | 32.00 | 8 | 60 | 12.10 |
| 2 1/2 | 30 | 33.75 | | | |
| 2 | 24 | 52.50 | | | |

* Prices shown cover carbon nipples.

ELECTROPLATING SUPPLIES**Anodes**

(Cents per lb, f.o.b. shipping point)

| | |
|------------------------------------|------------------|
| Copper | |
| Cast elliptical, 18 in. or longer, | |
| 5000 lb lots | 62.93 |
| Electrodeposited | 50.33 |
| Brass, 80-20, ball anodes, 2000 lb | 60.00 |
| or more | 21.25 |
| Zinc, ball anodes, 2000 lb lots | |
| (for elliptical add 2¢ per lb) | |
| Nickel, 99 pct plus, rolled carbon | 90.50 |
| (rolled depolarized add 3¢ per lb) | |
| Cadmium | 11.70 |
| Tin, ball anodes and elliptical | \$1.06 to \$1.10 |

Chemicals

| | |
|---------------------------------------|-------|
| (Cents per lb, f.o.b. shipping point) | |
| Copper cyanide, 100 lb drum | 50.50 |
| Copper sulphate, 5 or more 100 lb | |
| bags, per cwt. | 27.15 |
| Nickel salts, single, 4-100 lb bags | 33.25 |
| Nickel chloride, freight allowed, | |
| 300 lb | 46.50 |
| Sodium cyanide, domestic, f.o.b. | |
| N. Y., 200 lb drums | 22.35 |
| (Philadelphia price 22.60) | |
| Zinc cyanide, 100 to 900 lb | 55.55 |
| Potassium cyanide, 100 lb drum | |
| N. Y. | 48.00 |
| Chromic acid, flake type, 1 to 20 | |
| 100 lb drums | 29.25 |

BOLTS, NUTS, RIVETS, SCREWS(Base discount, f.o.b. mill)
Per Discount

| Machine and Carriage Bolts | Full Con- tainer Price | 30 Con- tainers | 20,000 Lb. | 40,000 Lb. |
|-------------------------------|---------------------------------|-----------------------|---------------|---------------|
| 1/2" and smaller x 6" | 55 | 55 1/4 | 60 1/4 | 61 1/4 |
| and shorter | | | | |
| 1/2" thru 1" x longer | 46 1/4 | 50 | 52 1/4 | 54 |
| than 6" | | | | |
| Roll thread carriage | 55 | 55 1/4 | 60 1/4 | 61 1/4 |
| bolts 1/2 in. & smaller | | | | |
| x 6 in. and shorter | | | | |
| Lag, all diam. x 6" & | 55 | 56 | 60 | 61 |
| shorter | | | | |
| Lag, all diam. longer | 47 | 50 | 52 | 53 |
| than 6 in. | | | | |
| Plow bolts, 1/2" and | 54 | 57 1/4 | 59 | 60 |
| smaller x 6" and | | | | |
| shorter | | | | |

(Add 25 pct for broken case quantities)

Nuts, Hex, HP reg. & hvy.

| | Full Case or Keg Price |
|----------------------------------|---------------------------|
| 1/2 in. or smaller | 63 |
| 1/2 in. to 1 1/2 in. inclusive | 59 1/4 |
| 1 1/2 in. to 1 3/4 in. inclusive | 64 |
| 1 3/4 in. and larger | 58 |

C.P. Hex regular & hvy.

| | |
|--------------------------------|--------|
| 1/2 in. and smaller | 63 |
| 1/2 in. to 1 1/2 in. inclusive | 59 1/4 |
| 1 1/2 in. and larger | 58 |

Hot Galv. Nuts (All Types)

| | |
|------------------|----|
| 1/2" and smaller | 50 |
|------------------|----|

Semi-finished Hex Nuts

| | |
|--------------------------------|--------|
| 1/2 in. and smaller | 63 |
| 1/2 in. to 1 1/2 in. inclusive | 59 1/4 |
| 1 1/2 in. and larger | 58 |

(Add 25 pct for broken case or keg quantities)

Finished

| | |
|----------------|----|
| 1" and smaller | 65 |
|----------------|----|

Rivets

| | Base per 100 lb |
|----------------------|-----------------|
| 1/2 in. and larger | \$10.85 |
| 7/16 in. and smaller | 26 1/4 |

Cap Screws

Discount (Packages)
Bright Treated H. C. Heat
aged

| | |
|---------------------------|---------------|
| New std. hex head, pack- | |
| aged | |
| 1/2" diam. and smaller x | |
| 6" and shorter | 47 34 |
| 1/2", 3/4" and 1" diam. x | |
| 6" and shorter | 31 13 |
| 1/2" diam. and smaller x | |
| longer than 6" | 18 1/2 +1 |
| 1/2", 3/4" and 1" diam. | |
| & longer than 6" | 5 1/2 +19 1/2 |

C-1018 Steel
Full-Finished
Cartons Bulk

| | |
|---|-----------|
| 1/2" through 3/4" dia. x 6" | |
| and shorter | 47 63 |
| 3/4" through 1" dia. x 6" | |
| and shorter | 31 51 1/2 |
| Minimum quantity—1/4" through 5/16" | |
| diam., 15,000 pieces; 1/16" through 3/8" | |
| diam., 5,000 pieces; 3/8" through 1" diam., | |
| 2,000 pieces. | |

Machine Screws & Stove Bolts,

| | Discount | Mach. Screws | Stove Bolts |
|--------------------|----------|-----------------|----------------|
| Plain Finish | | | |
| Cartons | | 19 | 22 |
| Bulk | | | |
| To 1/4" diam. | | | |
| incl. | | 25,000-200,000 | 9 54 |
| 5/16 to 3/8" diam. | | | |
| incl. | | 15,000-100,000 | 9 54 |
| All diam. | | | |
| over 3" long | | 5,000-100,000 | — 54 |

Machine Screw & Stove Bolt Nuts

| | Discount | Hex | Square |
|----------------------|----------|----------------|--------|
| In cartons | | 16 | 19 |
| In Bulk | | | |
| 1/2" diam. & smaller | | 15,000-100,000 | 7 9 |

CAST IRON WATER PIPE INDEX

| | |
|--|-------|
| Birmingham | 119.0 |
| New York | 131.4 |
| Chicago | 133.4 |
| San Francisco-L.A. | 140.2 |
| Dec. 1955 value Class B or heavier | |
| 6 in. or larger, bell and spigot pipe. Nu- | |
| plantation: p. 57, Sept. 1 issue. Source: | |
| U. S. Pipe and Foundry Co. | |

REFRACTORIES

| | |
|---|-------------------|
| Fire Clay Brick | Carloads per 1000 |
| First quality, Ill. Ky. Md. Mo. Ohio, Pa. | |
| (except Salina, Pa., add \$5.00) | \$128.00 |
| No. 1 Ohio | 128.00 |
| Sec. quality, Pa., Md., Ky., Mo., Ill. | 114.00 |
| No. 2 Ohio | 98.00 |
| Ground fire clay, net ton, bulk | |
| (except Salina, Pa., add \$2.00) | 20.00 |

Silica Brick

| | |
|--------------------------------|---------------|
| Mt. Union, Pa., Ensley, Ala. | \$140.00 |
| Childs, Hays, Pa. | 145.00 |
| Chicago District | 150.00 |
| Western Utah | 144.00-165.00 |
| California | 170.00 |
| Super Duty | |
| Hays, Pa., Athens, Tex., Wind- | |
| ham, Warren, O., Morrisville | 150.00-157.00 |

| | |
|---------------------------------------|-------|
| Silica cement, net ton, bulk, Latrobe | 26.50 |
| Silica cement, net ton, bulk, Chi- | |
| cago | 24.00 |
| Silica cement, net tons, bulk, Ens- | |
| ley, Ala. | 25.50 |
| Silica cement, net ton, bulk, Mt. | |
| Union | 23.00 |
| Silica cement, net ton, bulk, Utah | |
| and Calif. | 35.00 |

Chrome Brick

| | |
|------------------------------------|---------|
| Standard chemically bonded, Balt. | \$98.00 |
| Standards chemically bonded, Curt- | |
| inner, Calif. | 108.00 |
| Burned, Balt. | 92.00 |

Magnesite Brick

| | |
|------------------------------|----------|
| Standard Baltimore | \$121.00 |
| Chemically bonded, Baltimore | 109.00 |

Grain Magnesite St. % to 1/2-in. grains

| | |
|------------------------------------|---------|
| Domestic, f.o.b. Baltimore in bulk | \$69.40 |
| Domestic, f.o.b. Chewah, Wash., | |
| Luning, Nev. | |
| In bulk | 42.00 |
| In sacks | 49.00 |

Dead Burned Dolomite Per net ton

| | |
|-----------------------------------|---------|
| F.o.b. bulk, producing points in: | |
| Pa., W. Va., Ohio | \$16.00 |
| Midwest | 15.60 |
| Missouri Valley | 15.00 |

METAL POWDERS

| | |
|---|-------------------------|
| Per pound, f.o.b. shipping point, in ten | |
| lots, for minus 100 mesh | |
| Swedish sponge iron f.o.b. | |
| Riverton, N. J., ocean bags | 8.50¢ |
| Canadian sponge iron | |
| Del'd in East, carloads | 9.5¢ |
| Domestic sponge iron, 98+% | |
| Fe, carload lots | 8.5¢ |
| Electrolytic iron, annealed, | |
| imported 99.5+% Fe | 37.5¢ |
| domestic 99.5+% Fe | 36.5¢ |
| Electrolytic iron, unannealed | |
| minus 325 mesh, 99+%, Fe | 57.0¢ |
| Electrolytic iron melting | |
| stock, 99.84% pure | 22.0¢ |
| Carbonyl iron size 5 to 10 | |
| micron, 98%, 60.8+%, Fe | 86.0¢ to \$1.55 |
| Aluminum freight allowed | 38.00¢ |
| Brass, 10 ton lots | 27.50¢ to 50.00¢ |
| Copper, electrolytic | 59.50¢ |
| Copper, reduced | 59.50¢ |
| Cadmium, 100-199 lb, 95¢ plus metal value | |
| Chromium, electrolytic 99.85% | |
| min. Fe .03 max. Del'd | 55.00 |
| Lead | |
| 3.90¢ plus metal value | |
| Manganese | 70.8¢ |
| Molybdenum, 99% | \$3.35 to \$3.55 |
| Nickel, unannealed | 31.00 |
| Nickel, annealed | 31.00 |
| Nickel, spherical, unannealed | |
| #20 | \$1.13 |
| Silicon | 43.50¢ |
| Solder powder, .70¢ to .90¢ plus met. value | |
| Stainless steel, 302 | 99.0¢ |
| Stainless steel, 316 | \$1.33 |
| Tin | 14.00¢ plus metal value |
| Tungsten, 99% (65 mesh) | \$4.50 |
| Zinc, 10 ton lots | 18.75¢ to 22.50¢ |

Ferroalloy Prices

(Effective Sept. 18, 1956)

Ferrochrome

| | | | |
|---|------------------------------|---------|-------|
| Contract prices, cents per lb contained | | | |
| Cr, lump, bulk, carloads, del'd. | 67-71% Cr, 30-1.00% max. Si. | | |
| 0.02% C | 41.50 | 0.20% C | 38.50 |
| 0.03% C | 41.00 | 0.50% C | 38.25 |
| 0.06% C | 39.50 | 1.00% C | 37.50 |
| 0.10% C | 39.00 | 1.50% C | 37.35 |
| 0.15% C | 38.75 | 2.00% C | 37.25 |
| 4.00-4.50% C, 67.70% Cr, 1-2% Si. | 27.75 | | |
| 3.50-5.00% C, 67-64% Cr, 2.00-4.50% Si. | 27.75 | | |
| 0.025% C (Simplex) | 34.75 | | |
| 0.10% C, 50-52% Cr, 2% max Si. | 35.75 | | |
| 8.50% max. C, 50-55% Cr, 3-6% Si. | 24.00 | | |
| 8.50% C, 50-55% Cr, 3% max Si. | 24.00 | | |

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max 0.10% C price schedule. Add 5¢ for each additional 0.25% of N.

Chromium Metal

| | |
|---|--------|
| Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe. | |
| 0.10% max. C | \$1.31 |
| 0.50% max. C | 1.31 |
| 9 to 11% C, 33-31% Cr, 0.75% Fe. | 1.40 |

Electrolytic Chromium Metal

| | |
|--|--------|
| Contract prices per lb of metal 2" x D plate (1/4" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max. | |
| Carloads | \$1.29 |
| Ton lots | 1.31 |
| Less ton lots | 1.33 |

Low Carbon Ferrochrome Silicon

| | |
|---|-------|
| (Cr 34-41%, Si 42-45%, C 0.05% max.) Contract price, carloads, delivered, lump, 3-in. x down, per lb of Cr, packed. | |
| Carloads | 44.65 |
| Ton lots | 48.95 |
| Less ton lots | 51.45 |

Calcium-Silicon

| | |
|--|-------|
| Contract price per lb of alloy, lump, delivered, packed. | |
| 30-33% Cr, 60-65% Si, 3.00 max. Fe. | |
| Carloads | 25.65 |
| Ton lots | 27.95 |
| Less ton lots | 29.45 |

Calcium-Manganese-Silicon

| | |
|--|-------|
| Contract prices, cents per lb of alloy, lump, delivered, packed. | |
| 16-20% Ca, 14-18% Mn, 53-59% Si. | |
| Carloads | 24.25 |
| Ton lots | 26.15 |
| Less ton lots | 27.15 |

SMZ

| | |
|--|-------|
| Contract prices, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr. 20% Fe 1/2 in. x 12 mesh. | |
| Ton lots | 20.15 |
| Less ton lots | 21.40 |

V Foundry Alloy

| | |
|--|-------|
| Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed. | |
| Carload lots | 17.20 |
| Ton lots | 18.70 |
| Less ton lots | 19.95 |

Graphidox No. 4

| | |
|---|-------|
| Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11% Ca 5 to 7%. | |
| Carload packed | 18.50 |
| Ton lots to carload packed | 19.65 |
| Less ton lots | 20.90 |

Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn. Cents per-lb

| | |
|---|-------|
| Producing Point | |
| Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore. | 11.75 |
| Johnstown, Pa. | 11.75 |
| Sheridan, Pa. | 11.75 |
| Philo, Ohio | 11.75 |
| S. Duquesne | 11.75 |
| Add or subtract 0.1¢ for each 1 pct Mn above or below base content. | |
| Briquets, delivered, 66 pct Mn: | |
| Carloads, bulk | 13.90 |
| Ton lots packed | 16.30 |

Spiegeleisen

| | |
|---|---------|
| Contract prices, per gross ton, lump, f.o.b. Falmerton, Pa. | |
| Manganese Silicon | |
| 16 to 19% 3% max. | \$94.00 |
| 19 to 21% 3% max. | 96.00 |
| 21 to 23% 3% max. | 98.50 |

Manganese Metal

| | |
|--|-------|
| Contract basis, 2 in. x down, cents per pound of metal, delivered. | |
| 95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe. | |
| Carload, packed | 45.75 |
| Ton lots | 47.25 |

Electrolytic Manganese

| | |
|--|-------|
| F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound. | |
| Carloads | 33.00 |
| Ton lots | 35.00 |
| 250 to 1999 lb | 37.00 |
| Premium for hydrogen-removed metal | 0.75 |

Medium Carbon Ferromanganese

| | |
|--|-------|
| Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn. | |
| | 24.15 |

Low-Carb Ferromanganese

| | | | |
|---|---------|-------|-------|
| Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%. | | | |
| | Carload | Ton | Less |
| 0.07% max. C, 0.06% P, 90% Mn | 35.80 | 38.60 | 39.80 |
| 0.07% max. C | 33.75 | 36.55 | 37.75 |
| 0.10% max. C | 33.00 | 35.80 | 37.00 |
| 0.15% max. C | 32.25 | 35.05 | 36.25 |
| 0.30% max. C | 30.75 | 33.55 | 34.75 |
| 0.50% max. C | 30.25 | 33.05 | 34.25 |
| 0.75% max. C, 80.85% Mn, 5.0-7.0% Si | 27.25 | 30.05 | 31.25 |

Silicomanganese

| | |
|--|-------|
| Contract basis, lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point. | |
| Carloads bulk | 12.95 |
| Ton lots | 14.60 |
| Briquet contract basis carloads, bulk, delivered, per lb of briquet | 14.40 |
| Ton lots, packed | 16.80 |

Silvery Iron (electric furnace)

| | |
|---|--|
| Si 15.50 to 16.00 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$100.00 gross ton, freight allowed to normal trade area. Si 16.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$93.00. | |
|---|--|

Silicon Metal

| | | |
|---|----------|----------|
| Contract price, cents per pound contained Si, lump size, delivered, packed. | | |
| | Ton lots | Carloads |
| 96.50% Si, 2% Fe | 23.95 | 22.65 |
| 98% Si, 0.75% Fe | 24.45 | 23.15 |

Silicon Briquets

| | |
|---|-------|
| Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si. briquets, bulk | |
| Carloads, bulk | 7.55 |
| Ton lots, packed | 10.35 |

Electric Ferrosilicon

| | | | |
|---|--------|--------|-------|
| Contract price, cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point. | | | |
| 50% Si | 13.50 | 75% Si | 16.40 |
| 65% Si | 15.25 | 85% Si | 18.10 |
| | 90% Si | | 19.50 |

Calcium Metal

| | | | |
|--|--------|----------|-----------|
| Eastern zone contract prices, cents per pound of metal, delivered. | | | |
| | Cast | Turnings | Distilled |
| Ton lots | \$2.05 | \$2.95 | \$3.75 |
| Less ton lots | 2.40 | 3.30 | 4.55 |

Ferrovandium

| | |
|--|------|
| 50-55% V contract, basis, delivered, per pound, contained V, carloads, packed. | |
| Openhearth | 3.20 |
| Crucible | 3.30 |
| High speed steel (Primos) | 3.40 |

| | |
|---|--------|
| Alisfer, 20% Al, 40% Si, 40% Fe, Contract basis, f.o.b. Suspension Bridge, N. Y., per lb. | |
| Carloads | 10.65¢ |
| Ton lots | 11.80¢ |

| | |
|--|--------|
| Calcium molybdate, 43.6-46.6% f.o.b. Langloeth, Pa., per pound contained Mo. | |
| | \$1.28 |

| | |
|---|--------|
| Ferrocolumbium, 50-60%, 2 in. x D contract basis, delivered per pound contained Cb. | |
| Ton lots | \$6.90 |
| Less ton lots | 6.96 |

| | |
|--|--------|
| Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, contract basis, del'd, ton lots, 2-in. x D per lb con't Sb plus Ta. | |
| | \$4.95 |

| | |
|--|--------|
| Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langloeth, Pa., per pound contained Mo. | |
| | \$1.54 |

| | |
|---|----------|
| Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Sigio, Mt. Pleasant, Tenn., \$4.00 unitage, per gross ton | |
| 10 tons to less carload | \$110.00 |

| | |
|---|--------|
| Ferrotitanium, 40% regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti | |
| | \$1.35 |

| | |
|--|--------|
| Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti | |
| Less ton lots | \$1.50 |
| | \$1.55 |

| | |
|--|----------|
| Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton | |
| | \$200.00 |

| | |
|---|--------|
| Ferrotungsten, 1/4 x down, packed, per pound contained W, ton lots, delivered | |
| | \$3.45 |

| | |
|---|--------|
| Molybde oxide, briquets, per lb contained Mo, f.o.b. Langloeth, Pa. | |
| | \$1.32 |
| bags, f.o.b. Washington, Pa. Langloeth, Pa. | |
| | \$1.30 |

| | |
|---|--------|
| Simnall, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per lb. | |
| Carload, bulk lump | 17.50¢ |
| Ton lots, packed lump | 19.50¢ |
| Less ton lots | 20.00¢ |

| | |
|--|--------|
| Vanadium oxide, 86-89% V ₂ O ₅ contract basis, per pound contained V ₂ O ₅ | |
| | \$1.38 |

| | |
|---|--------|
| Zirconium contract basis, per lb of alloy | |
| 35-40% f.o.b. freight allowed, carloads, packed | 27.25¢ |
| 13-15%, del'd lump, bulk-carloads | 9.25¢ |

Boron Agents

| | |
|---|--------|
| Borasil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3.14%, Si 40-45%, per lb contained B | |
| | \$5.25 |

| | |
|------------------------------|-----|
| Bortam, f.o.b. Niagara Falls | |
| Ton lots, per pound | 45¢ |
| Less ton lots, per pound | 50¢ |

| | |
|---|--------|
| Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4.5-7.5% f.o.b. Suspension Bridge, N. Y., freight allowed | |
| Ton lots per pound | 14.00¢ |

| | |
|---|------|
| Ferroboreon, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots | |
| F.o.b. Wash., Pa. Niagara Falls, N. Y., delivered 100 lb up | |
| 10 to 14% B | .86 |
| 14 to 19% B | 1.20 |
| 19% min. B | 1.50 |

| | |
|---|--------|
| Grinal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over | |
| No. 1 | \$1.05 |
| No. 79 | 50¢ |

| | |
|--|--------|
| Manganese - Boron, 75.00% Mn, 15.20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd. | |
| Ton lots | \$1.46 |
| Less ton lots | 1.57 |

| | |
|--|--------|
| Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots | |
| | \$2.06 |

RAILWAY EQUIPMENT FOR SALE

Used - As Is - Reconditioned

RAILWAY CARS

All Types

SERVICE-TESTED® FREIGHT CAR REPAIR PARTS

For All Types of Cars

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Diesel, Steam, Gasoline,
Diesel-Electric

3-AIR DUMP CARS (SIDE DISCHARGE)

Major—30-Cubic Yard, 50-Ton
Capacity, Lift Door Type

SPECIAL OFFERING

30-ALL-STEEL ORE CARS,
HOPPER TYPE

40 and 50-ton capacity

Excellent condition. Immediate delivery!

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"ANYTHING containing IRON
or STEEL"

THE CLEARING HOUSE

News of Used and Rebuilt Machinery

A Good Bet . . . Don't pass up the West Coast market. Check it before you sell your used machinery. There are a lot of takers for late model equipment in good condition. And even some 10-year-old machines are snapped right up.

California is the center for sales. The Los Angeles and San Francisco areas are busting out all over with new and expanding plants. Their appetite for new and used machinery is enormous. Example: In San Diego, Convair Div. of General Dynamics Corp. is putting up a \$40 million guided missiles plant. Of that amount \$20 million will go for machine tools and equipment.

Sheet Equipment Wanted . . . In the Los Angeles area, slow deliveries of new equipment are shoving lots of buyers into the used market. Guided missiles, aircraft, and electronics manufacturers are the big customers today. Most needed: sheet metal equipment. Used machinery dealers are scouring eastern markets for enough equipment to meet the demand.

With a good year so far, and prospects of a strong finish, used machinery dealers in northern California are optimistic.

"We should wind up about 50 pct better than last year," one dealer predicts. He thinks that figure will hold pretty much for the industry in this fast-growing area.

The most conservative optimist admits business is up five pct for the year so far. But he doesn't have any company. Others range from 20 pct to 25 pct and more in comparing 1956 volume with last year.

Tight Money Villain? . . . Is the tight money situation hurting business? One dealer, who says it is, observes, "We've gone about the limit in the amount of financial assistance we can give." But

others discount the immediate effect of tough credit. They explain that the small shops, who comprise the bulk of the used machinery customers, still can get money from the banks—though it's costly money.

Best sellers in the San Francisco Bay Area: heavy press brakes, shears, milling machines, turret lathes. Although ancient equipment—running up to 10 years—still sells, it's the newer stuff that moves.

Prices Have Advanced . . . Faster moving items, especially heavier equipment, are still imported from the Midwest. Because of the long-time wait for new machines, used stuff frequently is the only alternative.

Prices of used equipment have gone up along with new. On some merchandise the rise hasn't been too apparent because the price tags are unchanged from last year. Since the equipment is a year older, that is in effect a boost, one dealer points out.

Another dealer, who says business is up about one-third dollar-wise for this year, notes that the unit gain runs about 20 pct because of the price increases in the past year.

Seattle area used machinery dealers report some metalworking firms replacing machinery are handling the sales themselves.

Says one major dealer: "It's hard to say what's happening, but it looks like they're all getting into the used machinery business."

Everyone's In Act . . . It works this way. When a company gets ready to trade in machines for new ones, it calls a used machinery house for a bid—the usual practice. After getting the bid, however, the company adds a 20 pct markup and proceeds to handle the sale on its own.

CONSIDER GOOD USED EQUIPMENT FIRST

BENDING ROLLS

6" x 3/16" Niagara Initial Type
8" x 1/2" Webb Model 120-V Pyramid Type—NEW—
Late

10" x 10" Ga. Bertsch Initial Type
12" x 1/2" Southwark Pyramid Type
16" x 1/2" Niles Pyramid Type

BRACKS—LEAF TYPE

10" x 16" Ga. Dreis & Krump Hand Operated
12" x 1/2" Dreis & Krump Motor Driven

BRACKS—PRESS TYPE

10" x 1/2" Verson
12" x 1/2" Superior Hydraulic, NEW
12" x 1/2" Superior Hydraulic, NEW

CRANES—OVERHEAD ELECTRIC TRAVELING

5 ton P&H 25' Span 230 Volt D.C.
5 ton Shepard Niles 55' Span 230 Volt D.C.
5 ton Cleveland 90' Span 230 Volt D.C.
10 ton Cyclops 40' Span 230/440 A.C.
10 ton P&H 60' Span 230 Volt D.C.
15 ton P&H 48' Span 230 Volt D.C.
20 ton Toledo 70' Span 530/3/60 A.C.
25 ton L-B 60' Span 440/3/60 A.C.
25 ton L-B 70' Span 230/3/60 A.C.

Incl. 300 ft. Runway

60 ton Modern 80' Span 230/3/60

80 ton Niles 72' Span 230 Volt D.C.

120 ton Niles 60' Span 440/3/60 A.C.

CRANE TROLLEY

10 Ton P&H Type HMB 440/3/60—New 1952

FORGING MACHINES

1" Ajax Air Haul, pneumatic, late.

1" to 5" Acme, Ajax, National

HAMMERS—BOARD DROP

800 & 2000# Chambersburg J-2

1000, 1200, 2500# Chambersburg

1600# Billings & Spencer

HAMMERS—STEAM DROP

1000, 1200, 2000# Chambersburg

HAMMERS—STEAM FORGING

800, 1100, 1500# Niles-Bement-Pond

1500, 2000, 4000, 8000# Chambersburg

1000, 1100, 1500, 6000, 12,000# Erie

10 Ton Massey—New 1952

LEVELLERS—ROLLER

60" United 17 Rolls 3 1/2" Dia.

72" McKay 17 Rolls 4 1/2" Dia.

72" McKay 17 Rolls 2 1/2" Dia. Backed-up

84" McKay 17 Rolls 4 1/2" Dia.

MAGNETS

42 & 45" Dings All Steel Welded Construction

PRESSES—HYDRAULIC

250 ton Bilas Double Acting 42" Stroke 48x49" Bed

500 ton Elmes 18" Stroke Lower Platen 38"x60"

750 ton Baldwin Triple Acting Bolster 84" x 133"

1200 ton United Steam Hydraulic Forging Press

4500 Baldwin-Lima-Hamilton Hydr. Forging Press

PRESS—STRAIGHT SIDE

Clearing Model TFL1500-200 Triple Acting Strokes 40,

32, 16", Bed Area 100" x 200"

PRESS—TOGGLE DRAWING

2585# D Toledo Double Crank Toggle Drawing

15" Stroke Bolster 108" x 60"

PUNCH & SHEAR COMBINATIONS

Style EP Cleveland 36" Throat, Punch 1 1/4" thru 1"

Cleveland Style G Single End, 60" Throat

No. 1 1/2 Buffalo Universal Ironworker

ROLLING MILLS

14" x 16" Single Stand, Two High

12" x 14" Twelve Stand, Two High Strip Mill

12" x 16" Phila. Single Stand, Two High

15" x 30" G & M Single Stand, Two High

16" x 24" Farrel Two Stand, Two High

20" x 60" Two High Breakdown Mill

22" x 12" x 40" Lewis 3-High Shut Mill

28" x 34" United Single Stand, Two High

44" x 28" x 44" x 144 Three High

SHEAR ANGLE

8 x 6 x 1/2" Cleveland

SHEARS—SQUARING

8" x 1/2" Niagara

10" x 1/2" Cincinnati LATE

12" x 3/16" Niagara, SL-12

14" x 1/2" Dreis & Krump

16" x 1/2" Toledo

SLITTERS

12" Blake & Johnson

40" Yoder Slitting Line

G-48 Yoder Gang Slitter, 5" Threaded Arbor

STRAIGHTENER

Kane & Roach 2 Roll Rotary Straightener, M.D.

Capacity Mildsteel 1/2" to 1"

Kane & Roach 5 Roll \$2520-B, Capacity 1/2" to 2 1/2"

solid, 4 1/2" Tube

Aetna Standard 13 Roll Straightener, Capacity 2"

SWAGING MACHINE

25 1/2" Penn, Capacity 2 1/2" Tube, 3 1/2" Solid 10",

Die Length, Hydraulic Feed, LATE

TESTING MACHINES

60,000, 100,000, 200,000 Olsen & Riehle Universal

50,000 and 300,000 lb Compression

WELDING POSITIONER

14,000# Cullen Friendsted Model #140, 230/440

WIRE WEAVING MACHINE

Chain Link Wire Weaving Machine, With Butt

Welder, #9 & #11 Ga. Wire up to 12" Height

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72" Hammett 3-rod, rotary surface, new 1948.

18" x 60" Model 500 Hammett vert. appl., late.

12" x 36" Pratt & Whitney hyd. vert. surface, 1942.

No. 72AS Heald hyd. pl. internal, extended bridge,

1943.

No. 74 Heald hyd. pl. internal, X-sliding M. B. 1941.

18" x 36" Landis type G hyd. pl. cylindrical, 1942.

8" x 36" Cincinnati EA Filmetal pl. cylindrical, 1942.

HAMMERS

No. 3 G Chambersburg pneumatic, serial No. 2007.

No. 6-1 Nazel, pneumatic, late.

No. 80 Nazel, self-contained.

LATHES

No. 3 Gisholt Univ. Turret Lathe (3), 1942.

14" x 6" Henday Treadmill, 1940.

10" x 36" Lipe Carbo-Matic, 1942.

30" x 42" Bullard New Era vertical turret lathe.

128" x 90" G Niles Bement Pond engine lathe, 80

HP, M.D.

PLANERS

30" Rockford Hyd. Openside Shaper-Planer.

42" x 42" Liberty dbl. housing planer, 53 HP

M.D.

48" x 48" x 10" Gray Maxi-Service.

PRESSES

90 ton No. 92 1/2 C Toledo D.C. Str. Side.

200 ton No. 785 1/2-72 Toledo D.C. Toggle drawing.

500 ton No. 1025 Hamilton D.C. adj. bed, 60" x 100".

2000 ton No. 6 National Massey Forging Press.

SHAPERS & SLOTTERS

24" Gould & Eberhardt Universal.

32" Rockford Hy-Draulic universal.

32" G & E invariable, F.M.D.

30" Rockford openside hyd. shaper-planer, ser.

30H U35.

30" Rockford hyd. vertical slotter, new 1944.

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1 1/2" National Upsetter, guided ram, hard ways.

2" National Upsetter, guided ram, air clutch.

3 1/2" Ajax suspended slider, steel frame.

4" National high duty, vesp. & guided ram.

7 1/2" National Upsetter, air clutch, new 1944.

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20" x 30" United 2Hi Cold Mill, Roller Bgs.

Suitable for Precision Experimental work.

17 Roll backed up leveller, 3" x 30" Feissler.

5 Roll Heavy Duty Leveller 5 1/4" x 30".

6" x 30" BRODEN ENGINEERING DOWN COILER.

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Ajax & National Upsetters, suspended slide, 2 1/2", 3", 4", similar upsetters not suspended slide, 1/4", 1", 1 1/2", 2", 3"

5" Acme Upsetting & Forging Machines suspended slide, cam side die slide

700-ton Ajax High Speed Forging Press

50,000# Standard Double Draw Bench

#23 Abramson Bar & Tube Straightener

Pels FV-75 Bar & Biller Shear, Cap. 7 1/2" rd

10" x 1 1/2" Plate Shear, Long & Allstatter 10"

throat, M.D. Rebuilt

Also 10" x 1/2" L & A

Hilles & Jones and Buffalo Shears 1 1/2", 2",

2 1/2", 3", 3 1/2", 4" and 4 1/2"

1600 Chambersburg Model F Board Drop Ham-

mers, Roller bearing; double V-ways, Built

1943

1500 lb. Niles Steam Forging Hammer

4000# Niles Bement Double Frame Steam Forge

Hammer

Bradley Hammers, various sizes, including

500# Upright

Nazel Air Forging Hammers, #2-B, 4-B, 5-B

Williams White Bulldozers, #22, #3, #4, #25,

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Landis Landmaco and other Landis Threading

Machines from 1/2" to 4"

Single and Double End Punches

Angle Bender W. W. 4 x 4 x 1/2"

Angle Shear H. & J. 6 x 6 x 1"

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MACHINES, TAPPERS, COLD BOLT TRIM-

MERS, SLOTTERS, HOT HEADERS AND TRIM-

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MACHINES.

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MOTOR GENERATOR SETS

| Qn. | KW | Make | R.P.M. | D.C. Volts | A.C. Volts |
|-----|------|---------|--------|------------|------------|
| 1 | 2500 | Whas. | 720 | 600 | 4160/2300 |
| 1 | 2000 | Al. Ch. | 720 | 250 | 4160/2300 |
| 1 | 1200 | Whas. | 720 | 600 | 2300 |
| 1 | 1120 | Elliot | 720 | 200/280 | 2300 |
| 1 | 500 | G.E. | 1200 | 330 | 2300/440 |
| 1 | 500 | Ch. Wa. | 720 | 575/600 | 2300/440 |
| 1 | 300 | G.E. | 1200 | 350/275 | 2300 |
| 1 | 300 | Elliot | 1200 | 125 | 4000/2300 |
| 1 | 150 | G.E. | 1200 | 250 | 2300/440 |
| 1 | 120 | Whas. | 1200 | 250 | 2300/440 |
| 1 | 100 | Al. Ch. | 1200 | 250 | 4000/2300 |

DIRECT CURRENT MOTORS

| Qn. | H.P. | Make | Type | Volts | R.P.M. |
|-----|---------|----------|-----------|-------|-----------|
| 2 | 3000 | Whas. | Mill | 525 | 600 |
| 6 | 1500 | Whas. | Mill | 525 | 600 |
| 4 | 700 | Whas. | Mill | 250 | 300/700 |
| 3 | 600 | Al. Ch. | Mill | 600 | 300/600 |
| 2 | 600 | Whas. | Mill | 230 | 110/220 |
| 2 | 500 | Whas. | Mill | 250 | 285/710 |
| 1 | 450 | Whas. | SK | 230 | 450/600 |
| 1 | 350 | G.E. | CD-169 | 230 | 1150 |
| 1 | 200 | Whas. | Mill | 330 | 300 |
| 4 | 275 | Whas. | QM | 330 | 425/850 |
| 1 | 200/250 | El. Dy. | Ped. Brg. | 330 | 400/1200 |
| 1 | 200 | Whas. | SK-210 | 250 | 400/600 |
| 1 | 180 | G.E. | MPC | 230 | 400 |
| 1 | 150 | Whas. | SK-201 | 330 | 300/900 |
| 2 | 125 | Whas. | SK-184 | 230 | 575/850 |
| 1 | 125 | G.E. | MPC | 230 | 450/1150 |
| 1 | 100 | El. Dy. | 30-S | 230 | 450/1350 |
| 2 | 100 | El. Dy. | 30-S | 230 | 475/950 |
| 1 | 80 | Reliance | 651-T | 230 | 575/1150 |
| 1 | 60/80 | El. Dy. | 25-S | 230 | 525/1150 |
| 1 | 40 | G.E. | CD-123 | 230 | 500/1000 |
| 1 | 40 | Whas. | SK-140 | 230 | 500/1700 |
| 1 | 32 1/2 | Whas. | SK-150 | 230 | 400/1200 |
| 2 | 25 | Whas. | SK-95 | 230 | 1800 |
| 1 | 20 | Cr. Wh. | D.P.B.B. | 230 | 1150/2400 |
| 1 | 15 | Whas. | CD-85 | 230 | 400/1200 |
| 1 | 15 | G.E. | SK-100T | 230 | 500/1500 |
| 3 | 15 | Reliance | 155-P | 230 | 400/1600 |
| 1 | 10 | Whas. | SK-103 | 230 | 400/1200 |
| 1 | 10 | Al. Ch. | F-123 | 230 | 300/1200 |
| 1 | 10 | Whas. | SK-91 | 230 | 250/1000 |
| 1 | 7 1/4 | G.R. | CD-75 | 230 | 800/2700 |
| 4 | 5 7/8 | G.E. | TD-85 | 230 | 800/2700 |
| 4 | 5 7/8 | Reliance | T.E.F.C. | 230 | 337/1330 |

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- 1—34" x 25" x 112" 3-HIGH PLATE MILL with front and back tilting tables, 1500 HP motor and gear set; also 84" 3-high jump mill.
 1—30" x 97" BLOOMING OR SLAB MILL, 2-HIGH reversing.
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 1—12" x 22" x 40" 3-HIGH HOT SHEET ROUGH-1MG MILL.
 1—18" x 34" COLD MILL, 2 stands, 400 HP gear set.
 1—24" BAR MILL, 3-HIGH, 3 stands, with variable speed D.C. motor, traveling tilting tables, roller tables, saws, bloom shear, furnace.
 3—18" BAR MILL STANDS, 3-high.
 1—10" ROD MILL, 14 passes.
 1—34" x 192" ROLL GRINDER with motors and controls.
 2—ROLLER LEVELERS, McKay, rolls 80" face x 5½" dia., with gear box and universal spindles.

- 1—PICKLING MACHINE for sheets, Taylor design.
 1—44" ROLL LATHE, enclosed headstock, tailstock, plate rest, 25 HP, 500/1500 RPM, 230 volts D.C. motor and controls.
 1—36" ROLL LATHE, enclosed headstock, 25 HP, 400/1200 RPM D.C. motor.
 2—PACK FURNACES for hot sheet mills, 62" x 60", double chamber.
 16—AJAX electric induction melting furnaces, 2000 lbs. each.
 1—3-TON ELECTROMELT electric melting furnace, good condition.
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 1—58" GALVANIZING LINE for sheets.
 1—MESTA GUILLotine SHEAR, 8" stroke, 28" knife, 600 tons pressure.
 1—26 UNITED ALLIGATOR SHEAR, 5" x 5.
 1—UNITED #4 vertical open side bar shear.
 1—UNITED PLATE SHEAR, capacity 9/16" x 156"
 1—SHEET SQUARING SHEAR, Mesta, ½" x 156".

- 3—SHEET POLISHING MACHINES, Mattison, 36" x 120" and 48" x 120".
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 1—20 MEDART STRAIGHTENER, 2 rolls, cap. ½" to 1½" dia. bars.
 1—2 KANE & ROACH STRAIGHTENER for angles, channels, flats, squares, rounds.
 1—COKE OVEN PUSHER, used very little, excellent condition.
 1—3500 HP GEAR DRIVE, ratio 8.45 to 1.
 1—1800 HP GEAR DRIVE, ratio 19 to 1.
 1—1200 HP GEAR DRIVE, ratio 4.4 to 1.
 1—3500 HP MOTOR, 11000 volts, 3 phase, 60 cycles, 514 RPM.
 1—1200 HP MOTOR, 2200 volts, 3 phase, 60 cycles, 514 RPM.
 4—TURNING UNITS for hot dipped tin plate.
 1—DOWN-COILER for hot strip up to 48" wide.

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RE-NU-BILT GUARANTEED ELECTRIC POWER EQUIPMENT

A. C. MOTORS

3 phase—60 cycle

| Qu. | H.P. | Make | Type | Volts | Speed |
|-----|--------------|---------|---------|----------|-------|
| 1 | 1500 | G.E. | MT | 6900 | 1187 |
| 1 | 1100 | G.E. | IM | 2300 | 720 |
| 1 | 1000 | A.C. | MILL | 2300 | 240 |
| 1 | 800 | G.E. | MT | 2300 | 235 |
| 1 | 750 | G.E. | MT-573 | 2200 | 1190 |
| 1 | 700 | A.C. | | 2300 | 500 |
| 1 | 500 | Whas. | CW | 1250 | 350 |
| 1 | 400 | Whas. | CW-960A | 440 | 1170 |
| 1 | 400 | Whas. | CW | 440 | 514 |
| 1 | 400 | Whas. | CW-1213 | 2200 | 435 |
| 1 | 350 | G.Has. | IM-17A | 440/2200 | 720 |
| 1 | 250 | G.E. | MT-424Y | 4000 | 257 |
| 1 | 250 | G.E. | MT-559S | 2200 | 1800 |
| 1 | 250 | Al. Ch. | | 550 | 600 |
| 1 | 200 | C. Wb. | 20QB | 440 | 585 |
| 1 | 200 | G.E. | IM | 440 | 435 |
| 1 | 200 | G.E. | IM | 2200 | 580 |
| 1 | 150 (unused) | Whas. | CW | 2200 | 435 |
| 2 | 125 | A.C. | | 440 | 805 |
| 1 | 125 | Al. Ch. | | 440 | 720 |
| 1 | 100 | G.E. | IM-16 | 2200 | 435 |
| 1 | 100 | G.E. | IM | 440 | 600 |
| 1 | 100 | A.C. | ANY | 440 | 695 |

SQUIRREL CAGE

| | | | | | |
|---|--------|---------|----------|-------------|------|
| 1 | 800 | G.E. | KT-373 | 2200 | 1180 |
| 2 | 450 | G.E. | FT-559BY | 440 | 8570 |
| 2 | 450 | Whas. | CR-1420 | 2300/4150 | 354 |
| 1 | 400 | G.E. | IE-15B | 2200 | 1165 |
| 1 | 400 | G.E. | IK | 2200 | 580 |
| 1 | 200 | G.E. | IK-17 | 440 | 580 |
| 3 | 200 | G.E. | KT-557 | 440 | 1800 |
| 1 | 150/75 | G.E. | IK | 440/900/450 | |
| 1 | 150 | Whas. | CR-8588 | 440 | 840 |
| 1 | 150 | Whas. | CR | 440 | 380 |
| 2 | 125 | Al. Ch. | ARW | 2200 | 1750 |

SYNCHRONOUS

| Qu. | H.P. | Make | Type | Volts | RPM |
|-----|------|-------|-----------------|------------|-------|
| 1 | 7000 | G.E. | ATI | 2200/6800 | 600 |
| 1 | 4350 | C.W. | 3501SL4000/6800 | 12800 | 514 |
| 1 | 2850 | Whas. | .8 p.f. | 2300/4600 | 514 |
| 1 | 2800 | Whas. | .8 p.f. | 2300 | 720 |
| 2 | 2000 | Whas. | | 2300 | 120 |
| 2 | 1750 | G.E. | ATI | 2200 | 8000 |
| 1 | 735 | G.E. | ATI | 2200/12000 | 600 |
| 2 | 500 | G.E. | TR-7507 | 2200 | 1200 |
| 1 | 450 | Whas. | | 2200 | 128.5 |
| 1 | 450 | Whas. | | 2200 | 450 |
| 1 | 400 | G.E. | TR-7505 | 2200 | 1200 |
| 1 | 325 | G.E. | ATI | 440 | 1800 |
| 1 | 225 | G.E. | ATI | 440 | 1800 |

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Used Steel Mill Equipment For Sale

- 1—#3 Shear Line Scrap Baler, Max. Size Scrap roll 24" OD x 24" Long, New in 1942.
 1—30-Ton Alliance Crane Trolley with 10-Ton Aux. Hoist, Roller Bearing, 2 Motor—230 Volt DC.
 1—54" Bliss Coil Shear Line complete with conveyor, Coil Box, Leveler, Hump Table, Shear, Run Out Table, Piling Conveyor.
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- 75 H.P. LaPointe Hydraulic Broach, m.d.
 12 x 72" Thompson Automatic Flat Broach, m.d.
 10-ton, 84" stroke LaPointe Single Ram Vertical Surface Broach, m.d., late
 Type SBD-42-4 American Vertical Hy. Dup. Broach
 Type SBD-48-15 American Vertical Dup. Ram Surface Hydr. Broach
 No. 3 Oilgear Hydraulic Broach, type XA, 54" stroke, m.d.

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- 4'-11" col. Morris Mar-Speed Plain
 5'-14" col. Fosdick, m.d.
 5'-14" col. Carlton, m.d.
 7'-16" col. American Triple Purpose, m.d.
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NO. 4 ROLL & MACHINE

13" Knives

Capacity 4½" Square

IN STOCK—
 IMMEDIATE DELIVERY

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50'0" x 200'0" with 15 ton AC floor operated crane, mfd 1943, 25'3" under eaves, 20'0" c to c columns. Immediate delivery.

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 STEEL SHEET PILING

215 TONS BETH. AP-3—30", 24" & 30"
 177 TONS CARNegie M-16—31", 40" & 59"
 300 TONS CARNegie M-2—27"

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FOR SALE

CENTERLESS BAR GRINDING LINES

We have just purchased (six) 6 Bar Grinding Lines. Each line has one No. 3 Cincinnati Centerless Grinder for roughing and one No. 2 Cincinnati Centerless Grinder for finishing, complete with Type "B" Long Bar Fixtures, Stock Feeding Cradles, Conveyors, Discharge Tables and all auxiliary equipment. These units are as close to "Bar Grinding Automation" as you can get. All units in

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JOINT BARS, BOLTS, TIE PLATES, SPIKES &
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SPECIAL TRACKWORK.

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FOR SALE
HEAVY WALL SEAMLESS TUBING
1025-1045 CARBON

| FOOTAGE | OD | WALL | LENGTHS |
|---------|---------|-------------|---------|
| 80' | 6 1/2" | 1.150 | 25-28' |
| 2600' | 6.050" | .450/.510 | 16-24' |
| 1800' | 6.050" | .500 | 18-21' |
| 100' | 6 1/2" | .875 | 18-21' |
| 1348' | 7" | .500/.550 | 35-40' |
| 400' | 7.390" | .600 | 18-21' |
| 780' | 7 1/2" | .500 | 38-40' |
| 180' | 7.656" | .565/.575 | 16-21' |
| 3400' | 8 1/2" | .460 | 25-32' |
| 540' | 8 1/2" | .500 | 28-33' |
| 372' | 8 1/2" | .718 | 25-35' |
| 85' | 8 1/2" | .750 | 16-18' |
| 1325' | 8 1/2" | .875/.900 | 26-30' |
| 1890' | 8 1/2" | .904 | 26-32' |
| 38' | 8 1/2" | .950/1.000 | 18-20' |
| 175' | 8 1/2" | 1.375 | 24-26' |
| 1781' | 9 1/2" | .750 | 18-40' |
| 516' | 10 1/2" | .450 | 16-40' |
| 450' | 11 1/2" | .750/.800 | 16-20' |
| 2094' | 11 1/2" | .750/.800 | 16-40' |
| 725' | 11 1/2" | 1.150/1.200 | 10-25' |
| 452' | 11 1/2" | 1.450/1.500 | 16-25' |
| 254' | 11 1/2" | 1.700/1.800 | 16-26' |
| 440' | 11 1/2" | 1.750/1.800 | 16-25' |
| 126' | 11 1/2" | 2.100/2.200 | 16-20' |
| 246' | 11 1/2" | .425 | 6' |
| 136' | 12 1/2" | 1.000 | 20-30' |
| 158' | 12 1/2" | 1.312 | 12-24' |
| 156' | 14" | .500 | 34-44' |
| 76' | 14" | 1.125 | 10-23' |
| 278' | 14" | 2.100/2.200 | 16-20' |
| 203' | 14" | 2.600 | 10-20' |
| 38' | 14 1/2" | .875 | 18-20' |
| 15.6' | 36" | 1.000 | 15.6' |
| 16.8' | 38 1/2" | 1.436 | 8-8.8' |

Other Sizes Not Listed Available for Immediate Shipment from Stock Priced Right.

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HEVI DUTY Elect. Box 70 KW, 36" wide, 20" High, 48" Long—2000 deg. F.

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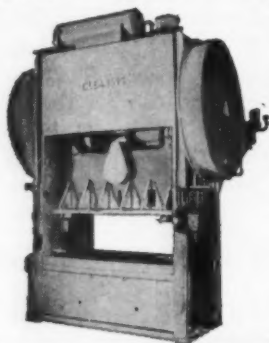
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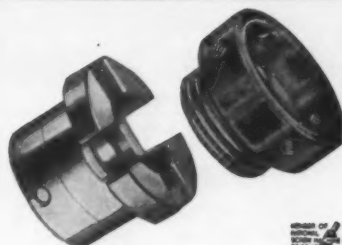
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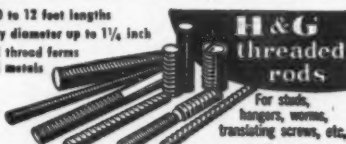
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Tax-Am Requests Top \$1 Billion Mark

Steel industry requests for tax amortization, since the Office of Defense Mobilization decided to reopen steel goals, have hit the billion-dollar mark. Latest to apply are Lukens Steel Co., asking tax-am for \$40 million heavy steel plate mill; Crucible Steel Co. of America, \$62.8 million for coke and rolling mill facilities; Inland Steel Co., \$100.2 million for rolling mills, and Detroit Steel Co., \$17.5 million for ingot and wiremaking facilities. This brings total of all requests to \$1.07 billion.

Acme Steel Purchases Newport Assets

Acme Steel Co. has taken over the property and assets of Newport Steel Corp., Newport, Ky., from Merritt-Chapman & Scott. It will operate under the name, Acme-Newport Steel Co. No change in management is reported.

New Skin Pass Mills For Bethlehem

Mesta Machine Co., Pittsburgh, was awarded a contract by Bethlehem Steel Co. for design and construction of two 48-in. two-stand tandem four-high skin pass mills. The units will be installed at Sparrows Point, Md.

Continental Can and Hazel-Atlas Merge

Continental Can Co. and Hazel-Atlas Glass Co.'s proposed merger went through as scheduled after Federal Judge Sidney Sugarman denied a restraining order sought by the Anti-Trust Div. of the Department of Justice. Hazel-Atlas is now a division of Continental Can Co., with stockholders to get 46/100 share of Continental common for each share of Hazel-Atlas.

USW Sets Cap for Clerks, Technicians

Organizing of clerical and technical workers in steel, aluminum and allied industries is next on the agenda for the United Steelworkers of America. "There is a great future for us there," says president David J. McDonald at the Eight Constitutional Convention at Los Angeles.

Blaw-Knox Gets Kaiser Mill Order

Blaw-Knox Co. received an order from Kaiser engineers for a slabbing mill to be installed at Kaiser Steel Corp.'s Fontana, Calif., plant. A 46 x 90 in. universal mill, it will be used to roll a full range of slabs for strip and plate production.

Record Steel Payroll In First Half

The iron and steel industry's estimated payroll set a record of nearly \$2 billion during the first six months of 1956. The total last year: \$1.67 billion.

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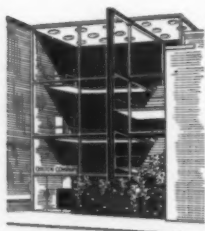
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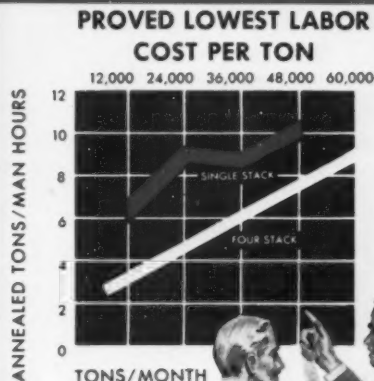
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